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Getting started

When I tell people what I do for a living, most assume that I *must* be an engineer. My geekiness does not help dispel that notion of course, but the fact is I studied business in college. And having done that, like most of my batchmates, I thought I was either destined to be a suit or to start 'something of my own'.

Quite a few of us were extremely gung ho about the idea of starting our own business. Our college curriculum even had a course on that subject for glob's sake – yes, we studied entrepreneurship. Students, especially from colleges like mine that were more focussed on the liberal arts, were literally infected by the idea that passions *have* to be pursued. Profits would naturally follow.

This was the year 2006 and somehow, we didn't refer to these endeavours in entrepreneurship as startups. At least the term wasn't as popular and ubiquitous as it is today. We'd say "business ideas" or refer to them as "ventures".

Either way, I did conceive one such "venture" and even executed it. It was a learning experience and if you bear with me, I'd like to share a wee bit of wisdom with you. Before that though, let me tell you why what I established was a "startup" (in the sense of what the word has come to mean today), and not a traditional business.

To start with (no pun intended), it was a tech-based initiative. The website that I launched aimed to streamline the admission process of Mumbai colleges. With literally hundreds of colleges in the city, students had to endure Mumbai's punishing rains, first to fill out admission forms, and then to physically go and check whether their names had appeared on admission lists. This list checking process had to be repeated more often than not, because any given college could release as many as four merit lists. This seems so futile in today's day and age, right? But, that's what was done back then. I was passionate about the idea and it had all the right ingredients for a good startup – a good idea, technology as the backbone, a burning need, a large user base, and scalability.

But it failed.

For this startup, I had the support of a few of my batchmates. Having endured the admissions ordeal themselves only a few months before, they were easily sold on the idea. We decided to approach the problem at the source – the colleges themselves. We went to about 30 of the best colleges (which probably got 90 percent of the applications anyway) and tried to convince the principals to put up the admission lists on our website. Being a frequenter of forums, I decided that the quickest way to do this would be by installing a forum, creating admin logins for colleges, and allowing them to upload their lists themselves.


The colleges refused. We suspected they weren't comfortable with the transparency we would inadvertently bring about.

If this was present day, and had the colleges refused, their reluctance to come on board would seem almost idiotic considering the technology available at our disposal. Most students today have high-res cameras in their pockets, and sharing those lists online would be just a click and tap away.

The idea would've sailed through to success quite easily.

The point I'm trying to make is that startups weren't easy – especially a few years ago, because the kind of technology ecosystem we have today was lacking. Capital was scarce and the idea of "dotcoms" still raised a few eyebrows.

Today, things are different. E-commerce is a reality; the Flipkart-isation of the country has begun. Most importantly, the primordial soup consisting of venture capital, userbase and talent is there. All you need is that one spark and your story will begin.

Get out there. Start something. 



Siddharth Parwatay
Assistant Editor
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"Students, especially from colleges like mine that were more focussed on the liberal arts, were literally infected by the idea that passions *have* to be pursued. Profits would naturally follow."

A handwritten signature in black ink, appearing to read 'Siddharth Parwatay'.

Let me know at: facebook.com/staticsid | [@staticsid](https://twitter.com/staticsid) | editor@digit.in

In pursuit of storage nirvana



Jayesh Shinde
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“As we produce and consume more data than we’ve ever done in history, paying for storage in the cloud will be the way to go – free services will be unsustainable for businesses and inconvenient for users after a point.”

Last month, just before the onset of the monsoon, I decided to do some late spring cleaning. As it turns out, I chanced upon an old shoebox full of CDs and DVDs from the early 2000s. After seeing the silver and golden Moser Baer discs with handwritten scribbles for titles, I was lost, gripped by nostalgia. For a second, hope led me to wonder – what if these discs still held data unscathed? I wasted no time, but alas, my data was gone forever – expensive recovery techniques aside. With that revelation, my reminiscence too disappeared, and I was left with an overwhelming sense of gloom 1.0.

I’m sure that we’ve all gone through this scenario while trying to hang onto our digital relics.


The problem is that it’s not just CDs and DVDs but even hard drives that fail after a point. When I lived in Bangalore, for instance, I purchased a 500GB external drive. Back then in 2008, I used it almost daily for over three years till I left that city in 2011. The drive sat neglected and forgotten in a cupboard of my home here in Mumbai for many months, until I plugged it in in 2012 to copy some data. The drive died on me after about a week’s sluggish performance. History repeated itself, gloom 2.0 set in.

Optical storage is limited, so is hard drive or flash storage. They all fail after a point, sooner than you think. True offline data storage isn’t a viable option, because what’s popular today will be out of fashion tomorrow. Porting data from a legacy medium to popular alternatives is ridiculously expensive today, and it will remain astronomically expensive in the future as well.

Our only immediate hope to store all our data is to spread it across cloud systems. This includes using Dropbox-like solutions, uploading photos onto Facebook, videos on YouTube, and distributed machines connected through P2P networks. As we produce and consume more data than we’ve ever done in history, paying for storage in the cloud will be the way to go – free services will be unsustainable for businesses and inconvenient for users after a point.

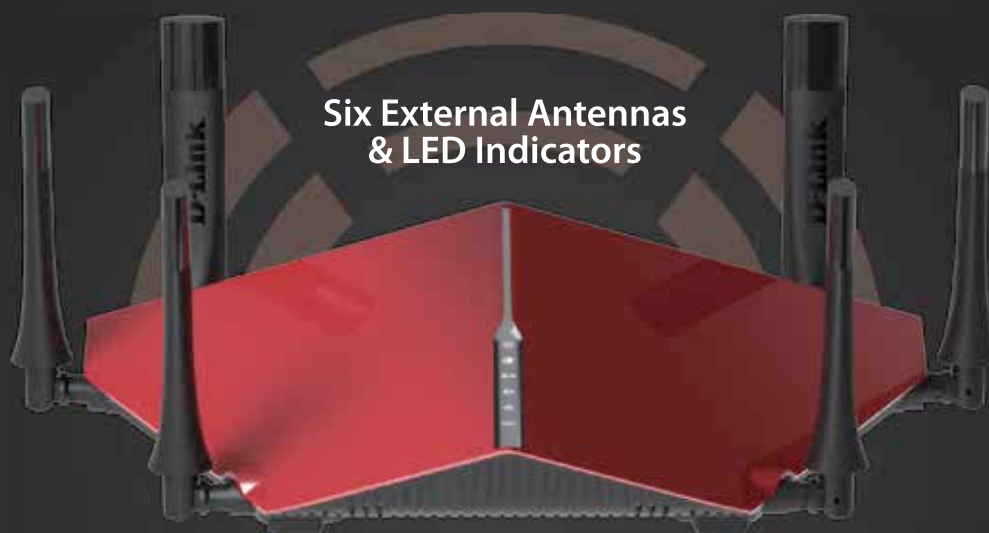
Let bygones be bygones. What could I do to ensure all data from this point on is preserved seamlessly, efficiently, and without pinching my pocket? How do you ensure that offline data backed up in hard drives won’t need you to pay an arm and a leg to translate into the popular medium at that point in the future? Meanwhile, what happens when all your favourite social networks or cloud storage providers start to go out of business? How will you migrate your terabytes upon terabytes of data from one source to another?

Despite storage prices falling to record lows, everything ultimately has a shelf life. And that means your data in the cloud can also “vanish” as long as that data sits with businesses that need to make a profit. Cloud storage providers are still using conventional spinning hard drives and are slowly starting to embrace SSDs. Despite announcements of Helium drives and Heat Assisted Magnetic Recording, we won’t see them for many more years. In the meantime, data is churned out left, right and centre, and there’s no way to capture it for posterity – no way to archive and freeze it forever.

M-Disc enabled optical media can apparently last a 1000 years – a claim that only future humans can verify, if they manage to find the disc in our fossil remains. But nothing else even comes close, even as far as tall marketing claims are concerned. For now, all I want is a way to be sure that whatever photos or videos I shoot of my daughter growing up will be easily visible in the next few decades off a storage medium I choose to invest in today, without too much trouble. I don’t think I will be able to handle gloom 3.0. 

Let me know your thoughts on this column at: facebook.com/jayesh.shinde / @jshinde | jayesh.shinde@digit.in

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Benq W1070+
ECS Z97 Machine
BoAT Pint
Nikon CoolPix S2900
ASUS P452L
LG Music Flow H7
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Comparison Test-Smartbands

Xiomi Mi band
Fitgen trek
Timex Ironman Move X20
GOQII Band
Huawei Talkband B2

Comparison Test-laptops

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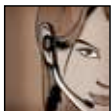
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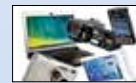
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I'm too old for this shit!

I'm quoting Danny Glover's character from the *Lethal Weapon* series of movies, of course. I quote him because this issue is somewhat of a milestone for me. It's the 150th issue of Digit that I've contributed to – starting as a trainee copy editor, back in January 2003.

It's crazy, the sheer amount of people I've had the privilege of working with for Digit in those twelve and a half years! I can't even remember the names of some of them, but then I'm terrible with names anyway. Before anything else, I just want to take the opportunity to thank everyone who worked with me (and put up with me) for any of those 150 issues. You're all truly special.

In the last 150 months, I've seen technology truly metamorphose from something niche that only a few of us geeks used, to something the world just accepts as commonplace now. From a time when students used to be just kids, to present day when some kids these days already have titles of CEO! Technology has truly enabled India.

Another reason for the headline is because at Digit, we've always had brilliant but lazy people. From guys who could code a CMS if you dared them to (before CMSes were commonplace) to gamers and misfits, we've had them all. We've also had the most interesting conversations here, especially during issue closing, when we'd spend days (weeks?) in office. Very often, those conversations would be about ideas that should be implemented in the technology world. Never once did it occur to us to go ahead and try to turn those ideas into reality ourselves, sadly. Every single current and ex Digit employee will testify to this...the sheer amount of ideas that a group of creative people can come up with is staggering.

I still remember wanting to build a software (app?) in 2004 that would help you recognise a song you heard, just by humming it – because you didn't know the name or the lyrics, just the tune. This was back when music was worth hunting for, not the artificially created tripe people listen to because the artists are "cute". Yes Beliebers and One Direction lovers, I mean you! Anyway, SoundHound kind of does that, though I think it would have been way more successful back in 2004 when I first thought of it, because people actually needed it more back then.

Twitter? We discussed something similar over pizza when stuck in office during the famous 26/7 Mumbai rains in 2005. Oh, and I remember hating the idea then, and I still do – billions of dollars or not!

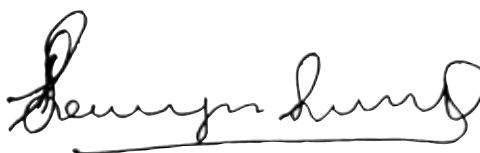
We also discussed all-touch devices about six months before the iPhone was launched. I remember that someone (can't remember who) put up an impassioned debate as to why touch was the future, because of the LG Prada and some Samsung model (but better software was needed). Being an old school Palm Zire user, I loved touch, and especially Palm's software implementation, so I argued on behalf of touch that day. Then six months later, the iPhone launched, became insanely popular, and proved that hypothesis correct as well.

There are so many more times this happened, but it's pointless to try and remember all of them. Besides, you get the basic idea, right? The point is that although many creative Indians might have had ideas for products that could be a global success, we had a totally defeatist attitude towards everything back then. Perhaps with good reason, perhaps not, however it was what it was. I, for one, regret that of all the brilliant people who came and went through Digit, not one of us backed our ideas with faith and action.

Today, however, that opportunity exists in India. You can actually get millions of dollars of investment with an idea and a plan, because someone will fall in love with your vision (and the profits it can earn them). We know this based on all past success stories, which were missing back in the day.

You can have an idea, and then decide to follow through on it. You can, really, be your own boss in today's India. All you have to do is not give in to the defeatist attitude like we used to. And it doesn't matter how old you are either, so long as you have passion and belief, nothing else matters. Perhaps it's why, at least when it comes to Digit, I'm still able to tell myself, after all these years, "I'm *not* too old for this shit!"

Now go build something already! 




Robert Sovereign-Smith
Executive Editor
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"We also discussed all-touch devices about six months before the iPhone was launched."

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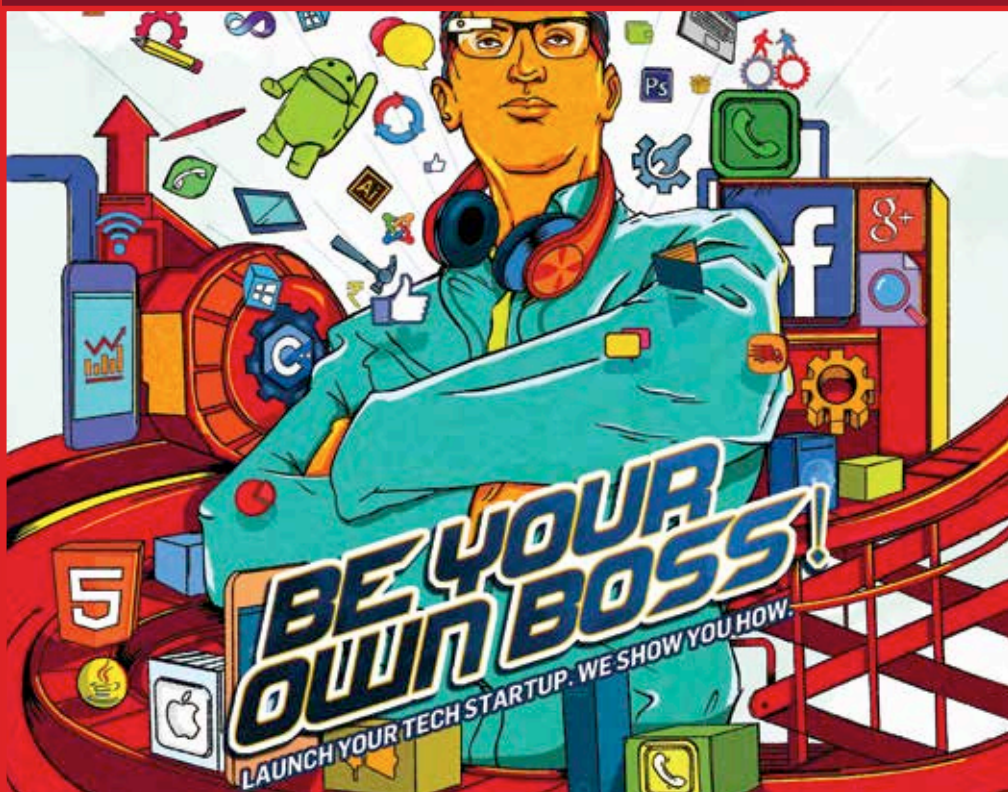
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Pint sized performance



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The most unusual smart watch

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ON THE DVD

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Google I/O 2015

Google announced a lot of things at their Google I/O 2015 conference that also included the announcement of the new version of Android. We've included the entire keynote in our DVD this time so that you can see all the exciting announcements from the conference.

Android M Pack

Give the Android M developer preview a spin with the factory image for a Nexus 5 device, or, you can emulate it using Android Studio.



Android M Factory images for Nexus 5

Android Studio

Android SDK tools



DGT

It's back, and it's inside Digit. It's still a work in progress, but send us feedback about it. We're going to try and integrate it seamlessly, so your feedback will be valuable.



Long live IPv6!

Finland celebrates National IPv6 day. Plans to make IPv6 mainstream. <http://dgit.in/finlandip>

✉ Hi Siddharth,

I'm a new subscriber of Digit and am just 14 years old. I'd like to ask you a few questions.

1. Can you change the format of the CDs you provide so that I can run it on a Mac. If that's not possible, can I make the CDs work by installing Windows on my laptop using Boot Camp?
2. If the answer is yes, how do I install Windows on my laptop?
3. Which console is better for gaming - Xbox One or PS4?
4. Can you include a Captain Price poster on Skoar!?
5. What are the minimum requirements to play GTA 5 on a laptop.
6. I'd like to discuss Steam with you. I don't know anything about it and would love to know what it's about and how I should use it. Is it even worth it and is it free? Does it require a credit card?
7. If you've played 'Shadow of Mordor', can you send me a review of the game?
8. I currently game on the Xbox 360 and want to know if there are any games that I could try out. I'm seriously in need of some good video games to play since I have nothing. I prefer FPS games over RPGs.

It would be very helpful if you could reply to my questions. I'm a huge fan of Digit magazine. Also, people come to me to borrow copies of the magazines but they like it so much that now they refuse to return them! Keep doing what you're doing and I will support you. Also if you could enable a Cash on Delivery option I would subscribe to the magazine. I hope you like my suggestion.

Thanks,

– Romil Agarwal

Hi Romil,

Nice to hear from you.

1. It should work on a Bootcamped Mac
2. This link should get you started: <https://support.apple.com/en-in/HT201468>
3. Oh, you've asked a very complicated question – one that entire FTs could be written about. To put it concisely, however, look at exclusive titles that you're interested in. For example, if

Feedback for the June 2015 issue of Digit



you'd like to play 'Halo', you'd have to go for the Xbox. The PS4 is slightly more powerful in terms of hardware, so it gives slightly better graphics performance. The PS4 also has more RPG titles, so I'd go with the PS4 if I were you.

4. Sure, we can do Captain Price, maybe in a nostalgia special.
5. Official minimum requirements:
Processor: Intel Core 2 Quad CPU Q6600 @ 2.40GHz (4 CPUs) / AMD Phenom 9850 Quad-Core Processor (4 CPUs) @ 2.5GHz
Memory: 4 GB RAM
Graphics: NVIDIA 9800 GT 1GB / AMD HD 4870 1GB (DX 10, 10.1, 11)
6. Steam is a digital distribution program for games. It makes acquiring games very easy and manages your library as well. It's nice to be on Steam for its free-to-play games and the ease with which you can play multiplayer games. The application itself is free and you only need a credit card if you want to buy games.
7. I've not played it but we did review the game here: <http://skoar.digit.in/pc/pc-review/middle-earth-shadow-of-mordor/>
8. I'm not a console gamer Romil but I'll ask around and get back to you.

– Siddharth

✉ Heya Team Digit! (Mostly, Siddharth!), I've recently started reading this magazine from last year. Initially, due to its price my parents didn't allow me to buy it every month. I somehow managed to order it online. However, I'm from Jamshedpur and the issues reach me by the end of the month.

I want to talk about the May issue (which reached me on 18th of June). It was really interactive and I liked the fun facts instead of broken links. Also, I liked the pages which were carrying good knowledge of science rather than advertisements. This issue came with Dmystify, which was just awesome. Really nice work. This issue's Skoar! was better than any other previous issue. The cover story made lots of sense and was knowledgeable. The movies given in the DVD were great. I've seen many readers complain about the UI of the DVD. As for me, I don't care how the data in it is presented, I'd cherish it just as much even if the interface remained the same.

Lastly, a suggestion, specifically about the price tag. Due to the magazine's price, I can't manage to get it every month from a book store. Also, on the matter of its delivery, I get issues at the end of the month. Many times, I thought of writing a review on the issue, but failed due to its late delivery. But this

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LETTER OF THE MONTH

✉ Hi, Team Digit!

Thanks to all of you for bringing out such an awesome magazine. Especially Sid, Jayesh and Robert and Mad Zombie a.k.a. Anirudh, of whom I'm a big fan. I've been reading it for the last 10 months. I belong to a place where most people think that modern tech is nonsense. When I first bought it (September 2014 issue), I felt awesome after reading it and decided to subscribe to it. I showed this magazine to the non-believers of modern tech and after reading it they realised that tech isn't useless. I liked the snippets on the top of pages. Thanks for providing such useful software, awesome game trailers and games in the DVD. I haven't come across a magazine like Fast Track, which provides such useful info. And what do I say about Skoar! It's like a gamer's Valentine gift or monthly dose.



Your magazine is amazing, but I want to help make it even better, so I have some suggestions:

1. Since it's a techie-focused magazine, why don't you include some tech jokes and riddles. Make it a "Know, Laugh Magazine" from a "No Laugh Magazine".
2. For the DVD UI, you can provide only icons and labels as Android does for its apps.
3. I don't know whether you've done it previously or not. Can you bring out a Fast Track about different OSes? It can either be targeted at computer platforms or mobile. As an idea for its cover, you can write "OS Wars".
4. You gave a "Timeline of GTA" in Skoar! Can you give a "Timeline of Prince of Persia"? There are many crazy fans of this game too.

5. Please provide 32-bit software in the DVD as everybody doesn't have a 64-bit OS.
6. Please provide some Autocad tutorials in your DVD. Many want to make their own 3D models.

– Saurav Kumar

📌 As much as I dislike the term, in this case I'm glad to have you on our side as a true "evangelist" Saurav. Hope you liked our joke poster this time – a small step towards making it a "Know, laugh magazine" as you call it. As for your OS wars suggestion we did a "World War III" cover for our Jan 2013 issue – so about a year and a half before you started reading Digit.

A timeline of Prince of Persia sounds like a good idea. We'll take that and all your other suggestions under consideration.

– Siddharth



time I thought, "Let it be late, the email will reach in time".

One last complaint: Did the May issue come bundled with a Fast Track? If yes, then the Fast Track has lost its track. I haven't got it.

Overall, I'll rate this magazine 9 stars out of 10. One deduction obviously for late delivery.

Thank You Team Digit for all your efforts in every issue. Hats off to you!

Sincerely,

A Digitian...

– Gaurav Kumar

📌 I'm surprised you didn't get the FT in the pack Gaurav. We sent you a copy as soon as we got your mail and till it reached you, I hope the PDF I sent managed to assuage your FT hunger. I'll get in touch with our circulation team to sort out the delivery issues in your particular location. Hope you like this time's dMystify – you can thank Robert for it. Happy reading.

– Siddharth

✉ Dear Team,

Happy Anniversary to the whole team on behalf of all the fans around the world. Coming straight to this month's edition, it was quite evident from past anniversary issues that this time too you'd wave your magical wand and enlighten us. True to this, the issue was indeed well crafted and the two posters idea was quite welcome.

Coming to quick review:

- 1) Editors as usual are world class and the addition of Nikhil is welcome
- 2) The embedded Dgt is quite entertaining and helps me keep track of the latest happenings around the world.
- 3) The cover story on how you test products is very well organized and crisp.
- 4) 'How you test in retail store' ensures smart consumers who can't be fooled by any gimmicks.
- 5) The DIY issue is something to preserve for ages, to pass on to the next generation.
- 6) 'Learn anything' and starting Crack the Code was a chilling experience.

As I'm an old subscriber, I'm going through past editions of Digit and sending you pictures of the same. Quite a nostalgic experience.



Now quickly coming to suggestions:

- 1) First things first. Kindly include a bookmark with your magazine. Yes, you read that right, the volume is increasing day by day which is welcome, so to keep track of each booklet one needs a bookmark. Kindly check feasibility.
- 2) In your 'How you test smartphones' section, you use the benchmarking techniques and rate it, however, I think rating should include after

डिजिट अब हिंदी में

देश का सबसे लोकप्रिय और विश्वसनीय टेक्नोलॉजी वेबसाइट डिजिट अब हिंदी में उपलब्ध है। नयी हिंदी वेबसाइट आपको टेक्नोलॉजी से जुड़े हर छोटी बड़ी घटनाओं से अवगत रखेगी। साथ में नए हिंदी वेबसाइट पर आपको डिजिट टेस्ट लैब से विस्तृत गैजेट रिव्यू से लेकर टेक सुझाव मिलेंगे। डिजिट जल्द ही और भी अन्य भारतीय भाषाओं में उपलब्ध होगा।

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डिजिट



Growing limbs

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FBI got busted by the US media for flying spy planes and conducting surveillance over 30 cities in US. Read more <http://dgit.in/fbiplane>

sales service provided. For instance, Micromax's Yu series phones don't have any physical service centers, and while they promise on-door service, is this on door service provided in every city of India? Similarly, with Xiaomi phones. They have only one service center in the whole Madhya Pradesh state. I suppose final rating should consider this factor

- 3) Kindly keep Digit T-Shirt as your Letter of The Month gift rather than something else, as we fans love to show our love towards you.
Regards,

– *Abhishek Kapoor*

4 Hey Abhishek,

That's quite a collection indeed. How to evaluate post sales services is something we've been trying to figure out ourselves. The trouble is that there's no way to empirically test after-sales service because there is great variance from geography to geography. Even on a case to case basis users have different experiences. Maybe we'll come up with a user-generated database or or continually updated cloud based rating system which will figure as a component in our final verdict. Stay tuned.

– *Siddharth*

Hi Team Digit,

The CTC of the latest edition was good (it looked easy afterwards whenever I pondered on it). Everything was good. I'd have liked the Dmystify to continue. The additional poster that was provided was awesome as well.

Ok, let's get informal now, shall we? A big hug to your entire team. Mad Zombie always engrosses me with his articles. Our ideologies match in every sense (Please ask him if he has a birthmark on his back!). The editorials by Sid and Jayesh always get me thinking in other ways about tech and our lives. How do you guys ponder over these matters so deeply? Digit is the best tech mag with no shortcomings, and it seems like only non-subscribers have issues with it.

So continue with your efforts. I'd like to have some coding-related content. However, I know it's too much to expect

considering everything that you pack in a single mag. So just continue with the good work.

P.S. I'd be ready to be your brand ambassador if only you'd provide me with an XL size T-shirt. Counting on you.

– *Jayant Jeet Tomar*

4 A birthmark eh? He actually does. Separated at birth?

– *Siddharth*

First of all, congrats guys and gals (as I've seen that there are some) on turning 14. The issue was amazing and one of the best since my first Digit (July 2014 issue).

There was a lot to do (or just learn if you don't really want to do!) - some useful and some not so useful. I mean who'd want to build a 3D printer (no offence to those who want to)?

I've read the letters from readers in the past months and have seen a lot of them complaining about many things which I don't really care about. So here I would like to answer them all on behalf of Digit if the team will allow me.

- Glue on subscription copies (resolved now):** I understand your concern, but why do you hesitate to tear the plastic which none of you keep.
- DVD UI:** I don't really understand what's wrong with the DVD UI. I get it that many of you are Android buffs and don't like iPad, but why create a fuss? Even if there was a new UI, for the first one or two months that would be buggy as well and then these poor guys will receive complaints about that too. Just deal with the classic UI, it's not bad.
- Typos:** If you understand what the word is, then why care about a small, teeny-tiny, little mistake. If you don't understand what it is, then how do you know it's a typo? It can be a Farsi or Mandarin or Arabic or whatever word. Typos can never be completely overcome, even with spellcheck, because no database will ever contain every word ever invented, including tech words and phrases. And creating a database? Oh, come on guys!
To Team Digit now:
My last one year with Digit has been

flawless and nothing has ever bothered me. My mag is always delivered to me at the right time with the right packaging and everything perfect inside. Just one question: are you going to continue Dmystify?

P.S. Stop sending posters, my room is already full. (Just kidding, don't take it seriously. I love them so much that I can buy a whole new house just for the posters.)

Hope this letter gets published. I typed a really huge email.

– *Abbigyan Pandey*

4 Thanks for all the suggestions and praise. We've taken note of the copy-editing issue you've noticed.

– *Siddharth*

Hello Digitians,

First of all, wishing us all a very Happy 14th Anniversary. I've used "us" because it feels like we're a family, though this was the first issue I managed to buy. I used to read Digit in the college library every month as soon as the current issue came in, and then there fought with the librarian the first few times asking for the DVDs that came with the issue until they finally allowed me to see them (feeling nostalgic). Digit was the only reason I visited library (No, don't even think that. I'm good at studies but used to study at home or with friends).

Coming back to today, when Digit is in its 15th year. This may sound odd, but this was the first issue I ever bought and it was bought by my own money (it feels so amazing!). What more could I ask for, you guys did an amazing job writing that anniversary issue and the cherry on the top was including all issues ever published in the DVDs. That's what made me feel like being with family after a long time - all your needs are served before you even ask. The Fast Track issue on learning and mastering skills from the giant web was very informative.

I wish you could do an issue on hacking (ethical, of course) and things such as courses, institutes, sites to learn from, etc.

Bye for now, as there's a lot to catch up on and many more issues to read. How



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could I have missed those? Did you publish them when I was on another planet?

Keep writing. Kudos. To infinity...and beyond!

P.S. I totally loved the poster including all those geeky quotes. It stands in front of me reminding me to appreciate the effort. May the ma be with you, guys.

– Kundan Tribhuvane

4 Indeed welcome to the Digit family. All our base are belong to you.

– Siddharth

✉ Hi, Team Digit!

This is my first feedback to you after reading five Digit magazines. You all are awesome (I know the word 'awesome' is too short for you, but I can't express my feelings in just 26 letters). I'm a 14-year-old subscriber and fan of yours. Now, you won't have to bear with me for long, as I'll come straight to some of your flaws and suggestions.

First, the things I like about you:

- 1) **Good paper quality:** Wow! You definitely use one of the best papers. I've seen very few mags with such paper quality.
- 2) **Knowledge treasure:** I'm amazed how you manage to get your hands on so much information about tech, automobiles, gadgets etc. and concisely disperse it to us.
- 3) **Dashing supplements:** Your Fast Tracks are superb. Topics like Arduino and Raspberry Pi were very informative. The booklet, 'Dmystify' is too good. It helped me understand relativity very well (as Google offers me only vague answers). Skoar! is like paradise for gamers like me.
- 4) **Very good DVDs:** I'm a fan of your DVDs. I definitely like your software, games and of course videos and trailers. I want to mention that I enjoyed 'The Charlie Chaplin' movie very much (Thank you for the movie). Now, I want to mention the flaws that

I've found:

- 1) **Age-old DVD UI:** Please try to improve your DVD UI. I'm bored of seeing the old tablet. You can try something cool like a sci-fi background or something new like modern gadgets.

- 2) **Disappearance of a DVD:** I was really shocked when I realised that you've decided to send only one DVD. The omission of one DVD is not at all acceptable (and I think most readers will agree with me). At first, you gave us more than 16 gigs of data, but now only 8 gigs. Please revive our dead DVDs (Alpha and Omega). The world is not at all mobile-centric (every person has a computer in their house). If it's not possible to send two DVDs each month, you can send two DVDs once every two or three months. And please give us some extra DVDs (full of games) in the special edition.

- 3) **Issues with supplements:**

Fast Track: It has no problem (It is, in one word, awesome)

Skoar!: Please increase its pages. How can one write about all the month's games in just 20 pages? I suggest increasing it to 40 pages.

Dmystify: Please publish this more regularly as a series.

- 4) **Lagging website and false links:** The website digit.in is too laggy. The new website skoar.digit.in is also lagging and feels a bit cluttered. The other problems are acceptable, but finding your links dead drives me nuts. Many links in the magazine don't work either. Please look into this.
- 5) **Typing mistakes:** I've noticed a few typing mistakes and grammatical errors in the magazine. Now, considering your hard work for this magazine these errors can be ignored but then we're talking about Digit.

I've already mentioned I'm a great fan of your DVDs, so can I get all the DVDs that were issued by you from the very first magazine till December 2014 or can you give the DVDs that were issued before December 2014 (it may not be the very first edition). If it's possible, please let me know how much it would cost me.

Thanks for reading this (I know you will definitely read it.)

You rock, Team Digit (again I'm running short of words).

And keep on Digitising.

– Shovan Bairi

- 4 Thanks for your very detailed feedback.

A big thank you for telling us what you don't like about our magazine, as it helps us improve. We'd definitely like more letters like this.

To reply to some of the points you raised, we are deliberating on "refreshing" the DVD user interface, however nothing's conceptualized yet. If you have any inputs, do let us know. We would love to increase SKOAR's pages, fill it with more gaming related content, and it will happen in good time. We're planning to hire gaming staff writers – can you write? Let us know. The dead links issue on our website is being fixed, and we apologize for the frustration it's causing you. Believe it or not, we hate it ourselves when we spot typing or grammatical errors in each of our articles (after it appears in print), and we are working hard to do a better job on this front.

– Anirudh

✉ Hi,

The red-letter day of my life was the day when I started reading Digit. I've been a great fan of Digit ever since. Hats off to you and your team's work in bringing out such a hot magazine and for exploring new ideas every month. Love the way you manage to put an entire world into the magazine's limited thickness.

The columns, comprising of wonders, charge me up when I'm wrecked. The links mentioned on the top of the pages are a great way to open up into little tidbits of fun.

Your concepts are truly new and rocking, which makes you guys the best "navigator" ever.

I'd like to wind up by telling you that if given the chance to award the Best Tech Mag of the Year, then I'd definitely shout "Digit!"

Waiting to hear from you guys.

– Jagrati and Geetanjali

4 Thanks for writing in you guys. As a team, we try to do things differently, and have our own unique take on technology and how it's affecting the world at large. We think we are still far from where we want to be, and through input from loyal readers like you and others in this space, we want to find new ways in exploring the world of tech.

– Siddharth

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> GREED

For those who just want more than should be humanly allowed, we have enough to satisfy your hunger...

THIS MONTH: Gigabyte Selfie Assistant, ZOTAC Mini PCs, curved 34-inch monitors, and lots of other latest peripherals sighted at COMPUTEX 2015

> TEMPTATION

If you're wondering what to do with yourself or how to spend some time getting cultured, this section is for you...

THIS MONTH: CROWD-FOUNDED MOVIE - KUNG FURY, ANIME INSPIRED MOVIES, JURASSIC WORLD, and more...

> DESIRE

ASUS Zenfone Selfie!

Taking narcissism to sinful new heights



ASUS Zenfone 2

The Zenfone 2 is the Snapdragon powered alternative to the current Zenfone 2. A Snapdragon 410@1.2GHz to be precise, accompanied by 2GB of RAM. The screen size is of the 5-inch, 720p variety, but it must be pointed out that despite the reduction in resolution, the screen is every bit as good as the one on the Selfie. The cameras are a step down, only offering 12MP/5MP for the front/rear cameras.

Unveiled to much fanfare and quite a large crowd at COMPUTEX 2015, Taipei, the Zenfone Selfie is one of those rare examples of a phone that's built with a singular purpose in mind, that purpose being the taking of selfies in this case. The phone itself is nothing spectacular to behold, but it does feel quite nice and the hardware is powerful enough to keep the UI and experience fluid, which is all that's really required for most of us.

The real stars here, as evidenced by the name, are the two cameras which are, frankly, quite exceptional and capable of taking excellent images in the right conditions. The phone was running on Android 5.0.2 at the time of



launch, which was overlaid by a custom skin that didn't seem to heavy on the system. Speaking of software, the camera software boasts of a "beautification" mode that is purported to "beautify" your selfies by removing blemishes, adjusting skin tone, etc.

SPECIFICATIONS

SoC: Qualcomm Snapdragon 615 | **RAM:** 2/4GB | **Storage:** 16/32/64GB | **Cameras:** 13MP front/rear with laser AF and dual-tone flash | **OS:** Android Lollipop | **Display:** 5.5-inch @ 1080p

Price: TBA

ASUS Zenpad 8

An 8-inch tablet this, it's powered by an Intel X3 SoC and is available in 8GB and 16GB variants. The screen itself is "only" 1280x800 however, but ASUS claims to have use what they're calling "True2Life" technology to enhance the image quality of the display.

Dolby Cover

Also showcased were an assortment of covers and accessories for the Zen series of devices, the most notable of which was the Dolby Cover which integrates speakers into the cover itself and claims to offer 6 channel audio support and 6hrs of audio playback.

ASUS Zenpad 10

The 10.1-inch Zenpad 10 is yet another 10-inch Android tablet, but this one comes with ASUS's Transformer series pedigree and thus, is accompanied by a proper Bluetooth keyboard case and you also get to choose from an assortment of accessories and cases.

ASUS Zen AiO

AiOs might be a dime a dozen now, but the new Zen AiO puts them all to shame with its monstrous specs. It's available in an i7 toting variant that comes packed with 32GB of RAM, PCIe3 SSDs in RAID and an NVIDIA 960M GPU. Specs to die for.

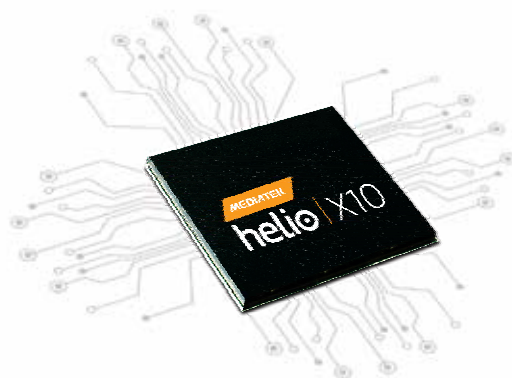
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ASUS STRIX Sound Cards

Stricken by the STRIX!

We managed to get a peek at a new series of sound cards from ASUS. Christened the STRIX, the top-end variant is called teh STRIX RAID DLX and is a 7.1 channel sound card that boasts of a signal to noise ratio of 124dB. Using an ESS SABRE9016 DAC and a whole bunch of accompanying software tweaks, the STRIX RAID will have the capability of powering 600Ω headphones and supposedly improves immersion. The STRIX is also available in the RAID PRO and SOAR variants and will cater to a variety of budgets.



ASUS PB328QT Monitor

Technically sound!

ASUS is known for it's exceptional, professional series of monitors and the PB328QT takes this to the next level with its Technicolor certification. What is Technicolor certification you ask? Well, a normal sRGB certification defines the colour gamut, but it doesn't define tolerances for colour quality. In the case of sRGB certification, there's no 100% guarantee that every sRGB certified monitor will display the exact same colour every time.

A technicolor-certified monitor on the other hand, is precisely tuned to very specific tolerances that have to be very strictly adhere to, ensuring that 10 times out of 10, the image quality will be precise.

The only slight niggle with this monitor, if it can even be considered an issue, is the fact that the monitor is "only" a 2K monitor and not a 4K one.

If you are a professional on the lookout for a professional display, you'll be hard-pressed to find a better display anywhere, that's for certain.



SPECIFICATIONS

Resolution: 2560x1440 | **Display Colour:** 1073.7M (10-bit) | **Brightness:** 300cd/m² | **Pixel Pitch:** 92ppi

ASUS Smart Home devices



COMPUTEX 2015 was about IoT and Smart Homes and ASUS had a wide range of accessories on offer including Smart Door Locks, Temperature sensors, Smart Meter Plugs,

Alarm Sensors and even a Motion Sensor. All these devices are "elegantly" designed to fit snugly into any Smart Home and will be able to talk to each other in certain configurations.

APP WATCH

Treehouse



Whether you want to learn coding or you want to start a business, Treehouse has a step by step approach that lets you learn at your own pace - it doesn't matter if you're a beginner or a pro. What makes this app special is that all its courses are efficiently organized in the form of streamlined tracks and are created to meet a high standard of quality by an in-house group of experts. It has a

diverse library with topics including PHP, Ruby on Rails, iOS development, and much more.

Android: <http://dgit.in/treehouseand>

iOS: <http://dgit.in/1LiXrkW>

Lybrate - Consult a doctor



Ever self-medicated or asked your pharmacist for a diagnosis? Lybrate is an app lets you consult doctors, book appointments, contact ambulances and get health related tips anywhere. Health queries can be put up in two ways - the first, free option is to post a question that is open to any doctor to answer and the second is a paid feature to chat directly with the doctor of your choosing. In addition, the app lets you set contact numbers of your

doctors and will allow you to call or send an SMS of your location to them quickly, in case of an emergency. There is also a corresponding personal assistant app for doctors, called Practice Management.

Android: <http://dgit.in/lybrateand>

iOS: <http://dgit.in/lybrateios>

Camcard



If you still move in a circle where business cards are exchanged, fret no more because this is the app you have been waiting for. After using your phone's camera to snap a photo

of the business card or just selecting a photo of one from your gallery- lo and behold!- the app fills in the appropriate fields in your phone's contact list using Optical Character Recognition. It also lets you merge the data in the photo with an existing contact, useful in case of a double sided business card for example. You can share these contacts through the usual SMS, QR code and emails but the app also lets you export them as vcards, excel sheets and even into your phone contacts. Go paperless, save a tree.

Android: <http://dgit.in/camcardand>

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CoolerMaster's MasterCase

Masterfully done

Easily the biggest announcement at COMPUTEX was CoolerMaster's new Master series of products and accessories. What's different? The design philosophy. CoolerMaster is going with a "Make It Yours" approach to design with its entirely new, modular range of cases and accessories. The Master Series of cases for example, boast of a standardised, modular chassis that can be upgraded and customised with a whole range of add-ons and accessories. Want a few additional HDD bays? Get yourself an HDD adapter and affix it to the rail. Want more space for your GPUs? Move the bays around and make more space. Want a 240mm radiator on the top, or want to seal it off for that matter? You can simply purchase the appropriate accessory and do exactly that.

These new cases will let you, as a PC user, build up the case over time, allowing you to create a uniquely personalised platform for your needs. What's interesting about this design is that now, you can purchase a case in 2015, say, and in 2017, simply upgrade and exchange components within the case to suit your needs. The plans for supplying accessories aren't a 100% finalised yet, but CoolerMaster is planning to work with the community to figure out the needs of the users and give them what they want. Whether this



will even extend to 3D printing necessary parts and accessories, or releasing design specs for free, we don't know. But we can say this much, this is an interesting, user-centric approach to design that we're sure PC users the world over will appreciate.

SPECIFICATIONS

Cabinet Type: Modular Mid-Tower (CM Master Case 5) |

Accessories: TBA

Price: TBA



Noctua's low profile cooling fans

Think case fans and the first name that should pop into your mind will be Noctua. At their booth at COMPUTEX, we got a chance to check out their new A-series fans that run faster, quieter and more efficiently than their predecessors, and also a look at their L-type low profile coolers that are ideal for mini-PC or HTPC setups.

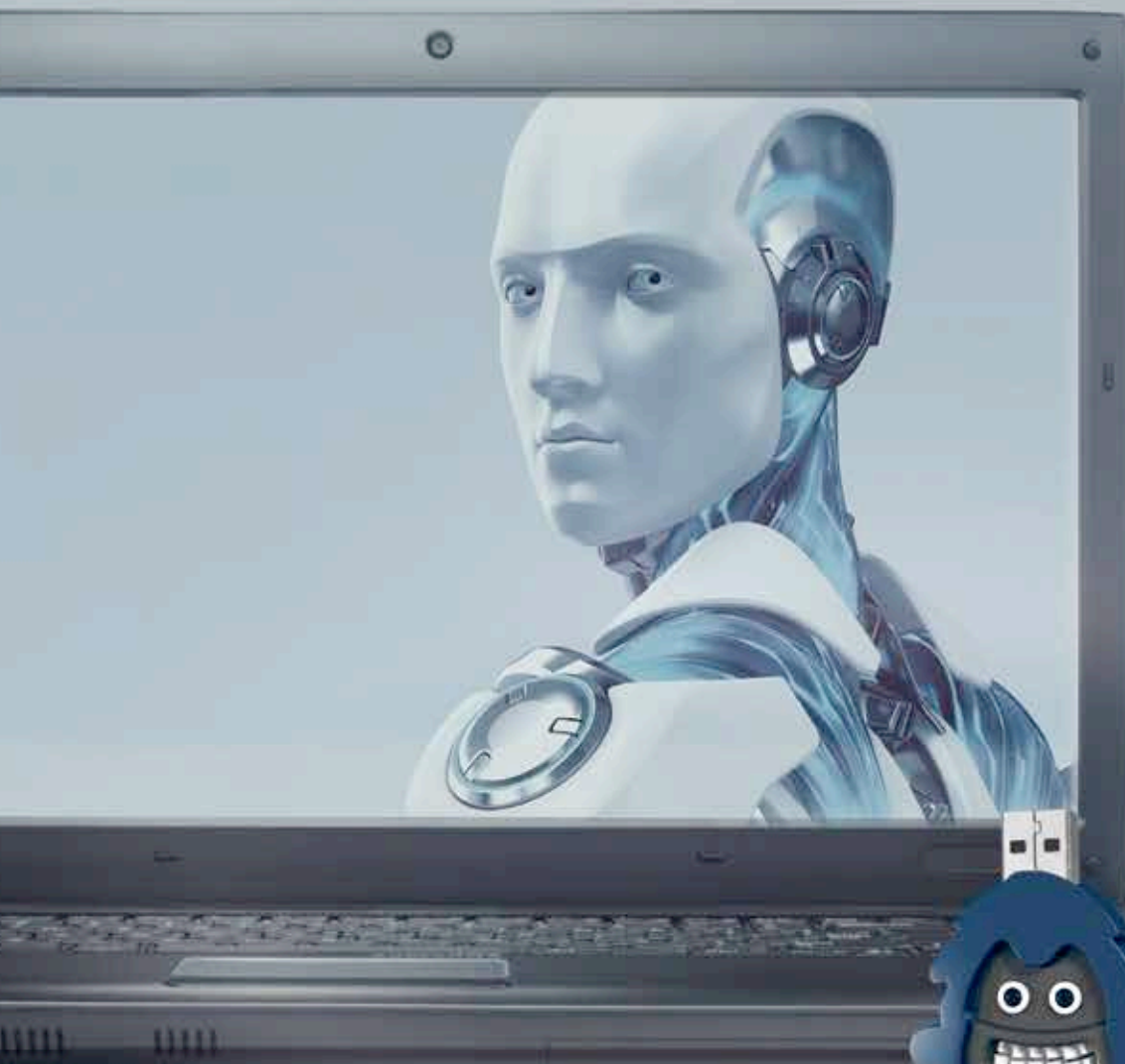
For those still waiting for the ANC fans (Active Noise Cancellation) however, there is some bad news. The fans are still not available for sale as of now and there's still some R&D to be done to fine-tune the performance.

From what we've been told, we can expect approximately a 2 ° C drop in temperatures across the board using the U-type coolers with the new A-type fans.

SPECIFICATIONS

5 inch 720p, Qualcomm Snapdragon 615 SoC, 2GB RAM, 13MP rear, 5MP front, 2400 mAh battery

Price: TBA



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Dell Inspiron 24 3000

The slimmest AiO in the world!

Dell's line-up at COMPUTEX consisted, as expected, of a completely revamped line-up of Inspiron and XPS devices. An interesting new device showcased there was the Dell Inspiron 24 3000 series AiO that is claimed to be the world's slimmest AiO (at 39mm).



The AiO is powered by an AMD A8 APU and comes with upto 8GB of RAM, upto 1TB of HDD space and an optional touch screen. We also got our hands on the Dell Inspiron 20 3000 series AiO, which, while obviously smaller at with a 19.5" monitor, is powered by an Intel Celeron N3150 or N3700 CPU. RAM and storage options are the same as on the 24" model and both devices come equipped with a wireless keyboard and mouse, Windows 8.1 upgradeable to Windows 10.

Dell Inspiron 11 3157 2-in-1

Flexible and well-built all-rounders!

While the PC world still struggles to find the right combination of tablet and laptop, Dell announced the launch of their 11" 2-in-1 devices. From our hands-on with devices, we can say that these initial models at least are quite well-built and despite being powered by Celeron CPUs (new generation, Braswell), the performance seemed to be adequate for regular work. To top it off, you get a claimed 8+hurs of battery life, which is always welcome.



The devices will come with 32GB eMMC memory (loaded with Windows 10) and an accompanying 500GB HDD. You get the usual bells and whistles in the form of Intel Dual Band Wireless

AC 3165 802.11ac support, Bluetooth 4.0 and even WiDi support. There's a 720p webcam in-built and the connectivity options include a HDMI 1.4a port, 1xUSB 3.0 port, 1xUSB 2.0 port and a 2-in-1 card reader.

Dell XPS 13



Dell's XPS 13 was the star of their booth, walking away with one of only five prestigious d&i award (design and innovation) at COMPUTEX 2015. This lovely, sleek device is a pleasure to

behold, exceedingly slim and designed to put every other device in its class to shame. If there was only one droolworthy product at the Dell booth, this has to be it.

SECURITY WATCH

NSA, GCHQ spying on Antivirus companies

The last couple of years have been bad for the security industry. Thanks to NSA whistleblower Edward Snowden, we found out how vast and deep NSA's spying capabilities are. No one is safe and privacy is just an illusion. Recently Kaspersky, one of the biggest names in the antivirus industry, revealed that their network was compromised, attack allegedly originating from Israel and the perpetrators looking for information to figure out ways to bypass the antivirus on the consumer's machines. But the recently released documents by Snowden show that they were not the first one to do this, and that NSA and GCHQ have been doing the same thing for many years. Read on to find out the whole story.
<http://dgit.in/nsagchq>



Google slips, Whatsapp Falls in EFF's "Who's got your back" ratings



"Privacy", "NSA", "leaks", this is all we have been hearing in the not-so recent past. We don't know how safe our data is and whether privacy is just an illusion created by our governments to fool us. Every year

EFF (Electronic Frontier Foundation) releases an evaluation report of how well various companies are protecting their users data, aptly titled "Who's got your back?". This year's report came with some very surprising and some not-so-surprising ratings of all the tech giants in the market. With Google falling down the ladder for the first time in years, and Whatsapp lying at the bottom rung, follow the link to find out which companies have your back and which don't.
<http://dgit.in/effrate>

Decade long journey of the biggest malware to hit the Financial market



It all started somewhere around the year 2006 when a new malware popped up somewhere on the internet. It wasn't anything out of the ordinary. Hundreds, if not

thousands, of new viruses, malwares and trojan pop up almost every day online. Most of them are just poorly coded or replicas of already existing malicious code that are easily detected by all your antiviruses. But Zeus wasn't one of them and it was going to leave its mark. and that it did. It's been almost 10 years since its inception and the software has cost hundreds of millions of dollars to the financial industry. With its creator still on the run, the story takes you through almost the decade long journey of Zeus and how FBI and investigators from 20 Cyber security companies finally found out who was behind it all.
<http://dgit.in/hackbig>

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noodoe Smart Watch

"If Apple Watch is a Barbie, noodoe is LEGO" - John W.

Of all the products at COMPUTEX, this was the most unusual in that it seemed to offer so little on the surface, yet promised so much. The noodoe watch, as you can tell from the images, is very much like Nike's smartband, a black strap with a monochrome LCD display. What does the watch do? It shoes you the time, an assortment of notifications and that's about it. Why should that appeal to you? The Apple Watch for example, offers so much more. Well, as Mr.Wang, the founder of noodoe puts it, the Apple Watch is like a Barbie doll, something special, a treasured totem in itself, something to covet.

On the other hand, noodoe is like LEGO, a watch that is all about what you can create. The focus with noodoe is on your creativity rather than on the watch itself. You create the watch faces yourself via the noodoe app (<http://dgit.in/1lzxyrM>) and upload them to your watch and there's an entire social network around these faces that you can participate in, creating and sharing watch faces.

The watch is simple because John Wang believes that what people really want from a Smart Watch is simplicity. As he puts it, eventually, you will get bored of things like the Apple Watch. After all, how many times will you share your heart-beat with someone? The



novelty wears off after a few months and in the end, you're only really left using the watch for notifications and to tell the time. Which is why the noodoe does exactly that, and only that. Nothing more.

The creator and founder of noodoe believes his watch to be more than a mere smartwatch, he believes it to be a way of life. Whether you agree with that philosophy or not is a personal decision, but a \$100 smartwatch that is designed purely with functionality and creativity in mind has certainly piqued our interest!



ROCCAT NYTH


Did you ever want a mouse that was so heavily customisable that it served you equally well for MMOs as it did for CS? A mouse with so many buttons that you could assign photoshop macros to it in one profile and then switch to WoW mode at the press of a button? Look no further than the ROCCAT NYTH. This intriguing mouse features a side panel that's made up almost entirely of buttons and these buttons can be removed and replaced with any number and configuration of buttons that you see fit, whether you need 12 (at least) or none.

All this customisability is accompanied by a brand new ROCCAT software for Windows that will let you completely customise and fine-tune the layout of the buttons to suit your needs as a gamer. Every single of the 12+ buttons can be completely modified and the profiles can also be saved on the device and switched as required.

SPECIFICATIONS

TBC

Price: \$130 (not final)



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Corsair Bulldog PC

The Bulldog PC demoed by Corsair is more than just any other small-form-factor PC for enthusiasts, it's a case and a PC designed from the ground-up to be a tiny, high-performance package for PC users. With dimensions of just 121.2x99.8x62.6mm, this PC packs in an i7 CPU, 16GB RAM, an NVIDIA Titan X and, most interestingly, a 600W, 80+ Gold certified PSU that's at least half the size of your regular 600W PSUs. If that wasn't enough, the entire thing is also liquid-cooled and despite being so tightly packed, everything is very accessible and placed behind hinged and removable panels that make customising this PC so easy. Truly the enthusiasts mini-PC.

AsRock Beebox

Small is big and the tiny little Beebox fills a lot of large shoes with its surprising capabilities. Powered by an Intel N3000 series SoC, the Beebox would, on the surface, seem like just about any other mini-PC, but what sets the Beebox apart is that the SoC has been tweaked to support dual-channel RAM, three display outputs (2xHDMI + DP) and because of this, is claimed to be the only min-PC in its class that's claimed to be



capable of seamlessly playing 4K content and powering three individual displays. If that wasn't enough, AsRock saw fit to bundle a remote with the device (a very thoughtful addition) and have also incorporated a Type-C USB port alongside the regular Type-A ports. This is definitely THE mini-PC to look out for this year.



MSI GT80 Titan SLI

The GT80s name, while misleading (there's no NVIDIA Titan to be found here), is indicative at least of the performance that you can expect from it. The GT80 is an exceptionally powerful device, powered by an i7 CPU, NVIDIA 980M SLI, SSDs in "Super RAID3" and upto 32GB of 1600MHz DDR3 RAM. If these specs aren't enough to put your measly little desktop to shame, consider the fact that the GT80 comes with a mechanical keyboard. Yes, the Cherry MX Switch variety made by no less a reputable company than SteelSeries, and the keys are backlit as well. The price is expected to be in the ₹2,00,000+ range. Considering the specs however, we wouldn't mind spending life short one kidney.



Kingston HyperX Cloud II headset

Kingston has been known for their memory and storage devices, not for peripherals. Last year however, Kingston surprised us with the exceptional performance and reasonable price of their HyperX Cloud gaming headset. This year they announced an upgrade in the form of the HyperX II headset. This new headset comes with a USB sound card with virtual 7.1 (we've never really liked virtual surround sound though), but everything else remains as good as the original, if not better.

Antec Signature S10

Fine craftsmanship from a fine craftsman

Antec is a company with a long pedigree of great cases and a reputation for craftsmanship and quality (though with a price to match). That tradition still continues with the gorgeous Signature S10 case. Featuring a "revolutionary" 3-chambered design, the case isolates your PC components into 3-chambers and each of those chambers is individually ventilated, allowing for better heat management.

There's one chamber each for HDDs, the motherboard and the PSU and since they're isolated, they each have their own set of fans to manage the airflow. Right in front is the HDD chamber with support for upto six standard HDDs in drive bays. The PSU chamber is at the bottom and also has SSD trays and above this is the motherboard chamber with a provision for a 240mm radiator up top.

The motherboard and PSU chambers are one above the other with the HDD chamber in front of them, but the HDD chamber is placed at a small distance from the mobo and PSU chambers allowing for intake fans to be placed at the front of them.

Built from 1.2mm cold rolled steel and 4mm brushed Aluminium side panels (with an option for glass or acrylic side-panels as well), this case is well-built and very sturdy. Everything is also tool-less,



making accessibility a no-brainer and installation, particularly of HDDs, easy as pie (and they're mounted on silicon grommets to reduce noise).

SPECIFICATIONS

Dimensions: 60x24x59mm | **Weight:** 17.7kg | **Fans:** 8x120mm fans at least | **HDD bays:** 6 | **SSD bays:** 8 | **Motherboard support:** upto E-ATX | **Top IO Panel:** 4xUSB3.0. 5.25" bay for Control Panel, HD Audio in/out, 1xPower/Reset button (tap to power/hold to reset)

Price: TBA



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GREED

Misc. Gadgets

While so far you've been looking at the highlights from COMPUTEX 2015, here are one other interesting gadgets that deserve to be mentioned.

Gigabyte Selfie Assistant

This is one of those things that you never knew you wanted. Gigabyte's Selfie Assistant is a device that attaches to your phone via Bluetooth and then uses motors to track



ensure that your phone's camera is tracking faces or an IR beacon (the remote). Now you can take selfies from just about anywhere with your hands as far away from the camera as possible. Sweet!

ECS at COMPUTEX

ECS's Liva PCs also made their presence felt at COMPUTEX. Running on the Intel N3000 platform as well, these devices were smaller than most of the mini PC offerings that we saw.

ECS sought to boost the popularity of these devices and at the same time, to demonstrate the capabilities of these tiny PCs by running a "How do you Liva" contest, getting participants to submit videos that were edited and created exclusively on Liva devices. The prize? ₹3,00,000.

We also caught a glimpse of a new line-up of I337 series of motherboards.



ZOTAC MINI PCs

Zotac unveiled an assortment of mini-PCs (from their Z-Box line). These included a handful of devices that were powered by the new N3000 platform, but we also saw some devices that were powered by Intel M series chips and NVIDIA M series GPUs. These devices are part of their gaming-centric line-up and will, some time in the future, be up for Steambox certification, which is an interesting development. Most of the ZBoxes on offer seemed to offer M.2 support, which looks to be a trend going forward. The option of a 2.5" HDD was also present on most devices.



G.Skill accessories

G.Skill has been teasing DDR4 RAM since last year, but we've yet to see any significant adoption rates anywhere. In the meanwhile, G.Skill has started work on a brand new, RIPJAWS line-up of gaming peripherals, offering 7.1 headsets (real and virtual 7.1), mechanical keyboards, gaming mice and even PSUs.

We managed to test the gaming headsets and mice for an extended period of time and came away somewhat impressed with the devices. We'll hold off on a full verdict till we can get them into our labs, suffice to say that the devices seemed quite capable.

Gigabyte Auros X7 Pro-Sync

G-Sync, SLI, gorgeous design, need we ask for more?

Gigabyte claims that this, the Auros X7 Pro-Sync is the “Earth’s Most Powerful 17” Slim Laptop”. Tall claims, but once we look at the specs, we’re bound to agree, but only because of the very specific wording. This is the most powerful 17” SLIM laptop but not the most powerful 17” laptop. The laptop will be available in various combinations, but the most powerful of which will offer three mSATA SSDs in RAID 0. Combined throughput? A claimed read speed of over 1500MB/s. Oh, and you can throw in a 3.5TB HDD for your storage needs as well. You also get 4 memory slots that you can choose to populate with up to 32GB of memory running at 1866MHz (a tad faster than the regular, 1600MHz).

A new thermal design ensuring consisting of six heat pipes and two exhaust fans coupled with side and rear exhausts work to keep the laptop cool under the extreme load of two GPUs and an i7.

What’s even more impressive is that all this hardware has been squeezed into a chassis that is just 22.9mm thick and weighs 3kg. The keys aren’t as fanciful as the mechanical keyboard that we saw on the MSI TITAN SLI, but the keyboard does use scissor keys for better response and stability, is backlit and comes with an assortment of macro keys to choose from.

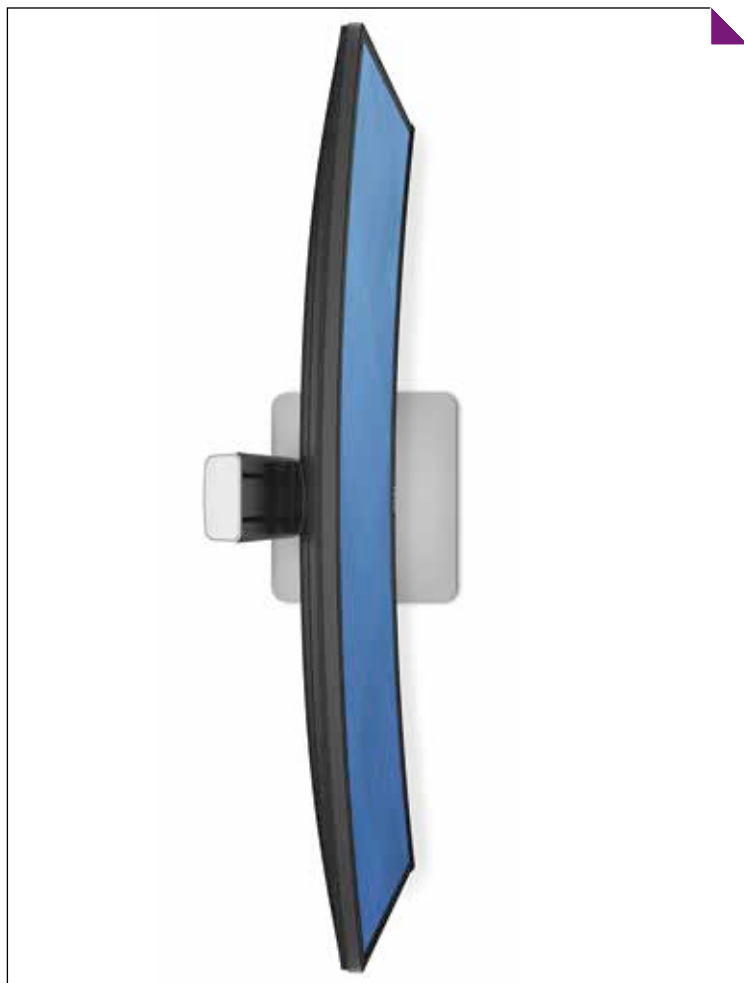


That’s enticing enough in itself, but you also get a 2.2 speaker set up! And no! that’s not a typo, two tweeters and two woofers is what you get. And did we mention that the display was G-Sync ready?

SPECIFICATIONS

CPU: Intel Core i7 4870HQ | **GPU:** NVIDIA 970M SLI | **RAM:** 32GB (1866MHz) | **Display:** 17.3" @1080p with G-Sync | **Storage:** 3xM-SATA slots, 1x2.5" HDD Bay

Price: TBA



Curved, 34" monitors

34" of pure awesome!

If there was one thing that there was no dearth of at COMPUTEX, it had to be 34" curved, G-Sync ready monitors. From what we know of G-Sync, NVIDIA certifies certain panels as G-Sync ready and manufacturers can then pick up these panels, rebadge them and sell them at a price of their choosing and at COMPUTEX, everyone did exactly that. We saw seemingly identical monitors from everyone, Acer, ASUS, Dell, MSI and more.

Still, it’s not that such variety is a bad thing. These monitors were gorgeous and the gaming experience on them was something special. The curved display in particular, coupled with G-Sync, was very conducive to immersion and we had a blast trying out monitors from every manufacturer that we could find. As gamers ourselves, these monitors were far more interesting than any of the 27" and 32" 4K monitors that we saw all over the place.

Honestly, we couldn’t pick a favourite. They were all at par, all with unique and interesting stand and bezel designs. When we finally get to test these monitors, we suspect that their performance will be largely similar and that a purchase decision will come down to availability and your brand affinity.

SPECIFICATIONS

Display: 34" @3440x1440 | **Contrast Ratio:** 1000:1 | **Brightness:** 300cd/m2 | **Pixel Pitch:** 0.2325

Price: TBA

ASUS ROG GR8

Console-sized powerhouse

As much as Microsoft and Sony would have you believe, nothing beats a good PC when it comes to gaming and with it's GR8 PC, ASUS has shown that great power can come in small packages. The GR8 PCs is powered by an i7 CPU and the latest generation of NVIDIA desktop GPUs (960/970/980) or even a 750Ti in certain configurations, both stuffed into a package that's about the size of an Xbox One or PS4, if not smaller.

Despite the size, cooling apparently is something that you needn't worry about because air the air is sucked in from the front and bottom of the case and blown out the top and rear, encompassing all the components within the PC. To top it off, the PC is claimed to only consume less than 20W on idle.

PCs like this are the perfect companion to LAN parties, function as console-replacements when attached to your TV. The case encases a volume of a measly 2.5 litres and (even a small case usually holds 12 -15 litres). To make the deal sweeter, ASUS also showcased an assortment of ROG themed accessories and carry bags, including a particularly enticing looking, felt-lined PC suitcase that was packed to the gills with an assortment of accessories that you'd need for any LAN party. These accessories included a



GR8 PC, a STRIX headset with accompanying ROG Gladius mouse, a rolled-up keyboard and an Xbox 360 controller. Now that's how you roll to a (LAN) party.

SPECIFICATIONS

CPU: Intel Core i7 | **GPU:** NVIDIA GPU | **RAM:** at least 8GB

Price: TBA



ZOTAC NVIDIA 980Ti AMP! Extreme

Nvidia's 980Ti is the holy grail of GPUs as far as we're concerned (the TITAN X is awesome of course, but it's too fanciful) and everyone at COMPUTEX was busy flaunting their version of the card. ZOTAC went a step further by only offering factory overclocked editions of their card from the get-go.

Using a brand new cooler design, the 980Ti will be available in three overclocked variants, the ArcticStorm, AMP! and AMP! Extreme! editions. The latter will be factory overclocked by a full 25%, taking the base clock from 1000MHz to 1253MHz (boost goes upto 1355MHz). Does that translate to a 25% boost in performance? We don't know. Keep an eye on this space for when we get our hands on a review sample of this monster of a card.

SPECIFICATIONS

Memory: 6GB | **Memory Interface:** 384-bit | **Core Clock:** 1253MHz (1355MHz boost) | **Cores:** 2816

Price: TBA

Eargasm

Here is a list of Indie and Alternative bands that you cannot miss out on. Just cannot!

Alt J (delta) - One of our favorite alternative rock bands. Their music has a haunting ethereal feel that can sometimes be delicate and sometimes be pretty twisted. Yes, delta is what you get when you press Alt+J on a Mac.

Triangles are our favorite shape.



The Black Keys - Our favorite new garage rock artists. Listen to them if you want a brilliant combination of the blues and rock.

Bon Iver - The unique vocals and soulful sound of this indie folk band is why we have them on repeat.

Bombay Bicycle Club - The sounds that this band makes can more than a little intoxicating. It is a danceable combination of the indie style and electronica

The XX - This is a type of music that grows on you. Although they have just one album out, we cannot get enough of the indie pop band.

The Neighbourhood - These guys mix indie rock, electronica and a little hip hop with soulful sad vocals is a diffusion that we want more of.

FILM REVIEW

Kung Fury

For an unadulterated '80s trip unlike any you've embarked upon...

It would be a travesty to call Kung Fury a short film. It transcends the very definition of the medium to achieve much more. Most films can be described as commercial endeavours where the artistic side is only a small and largely overlooked aspect. By that definition, Kung Fury is less of a film and more of a love letter to what's arguably the golden decade characterised by electro synth-heavy music, badass action films, 8-bit videogames, and the mullet - the '80s. And it nails that crazy concoction down to near perfection.

The closest that any recent movie has come to doing that is The Guest (2014), which packages a razor sharp thriller as a thinly veiled homage to '80s. Prima facie, Kung Fury may seem similar, but it eschews subtlety to deliver what can be best described as an '80s experience in its purest, most unmitigated form. If The Guest were to be described as popping an ecstasy pill, Kung Fury is more akin to having two big-bore shots of dopamine and endorphins injected intravenously.

If you're an '80s kids, the film makes no pretence about building a plot, character development, or any of that hippy nonsense. The narcotics analogy is fitting because this is

an experience engineered to feed your basest instincts. And it does that competently by incorporating the best elements from '80s pop culture and weaving them together in a heady montage that not only entertains you, but leaves you with what could be best described as a cinematic equivalent of a heady climax.

The plot draws inspiration from various '80s action film tropes. You have Adam playing the chosen one and/or badass kung fu cop and the big evil is a time travelling version of Hitler dubbed Kung Fuhrer. This recipe is garnished with homage to the original 8-bit Mortal Kombat, a tame T-Rex, chaingun wielding Red Sonja, Thor, hacking time with a Nintendo Power Glove, and most of the pop culture action flick references ranging from Predator to the Terminator. All this is set to a sublime and distinctly '80s electro synth soundtrack, with the title song sung by another '80s icon David Hasselhoff - that guy from Baywatch.

Kung Fury seems to have given Hollywood its next Neil



Blomkamp. The short was created completely by one man - David Sandberg - in his basement with nothing but a green screen, his girlfriend, and SFX as well as actors paid for by the \$600,000 raised by a crowd-funding campaign. How good this really is, you ask? Well, it's a 12-gauge shotgun blast of awesomeness to your face at point blank range. The only conceivable problem is the serious case of insatiated craving you'll get after it ends at the 30 minute mark. Wish there was more of this mania, maybe a crowdfunded Part 2?

Rating: ★★★★★

- Nachiket Mhatre



Lucifer
Scheduled to premiere in 2016, the series focuses on the lord of the underworld who abandons his kingdom after a girl from Los Angeles and helps the NYPD in punishing the criminals. Doesn't sound too devilish.



The expanse
Based on the space opera novel "Leviathan Wakes", starting with a simple murder case and turning to a conspiracy that threatens the survival of humanity, this series takes the normal fantasy/action genre to new heights. Out of this world.



Blindspot
It's basically Memento turned to a series with a female lead. An amnesic woman, with body covered in tattoos, on unravelling that the tattoos may be clues to crimes, works with the FBI in search of her own identity. Unmissable.

BLOCKBUSTER MOVIE REVIEW

Jurassic World

Killing for sport in a prehistoric theme park

The new Jurassic movie takes place on the same island of Isla Nublar and delivers enough fun dinosaur action to remind us why we love these beasts. The good news is that the movie invokes the evergreen Humanity vs Nature theme along with adequate amounts of the dino on dino action we were hoping for. The bad news is that it panders heavily to Jurassic Park fans and the fact that the whole film is built on topping the spectacle of the previous films, apparent from the recurring “Bigger, Louder, More Teeth” slogan. Oh, and don't worry, there are plenty of dinosaurs here to keep all you budding paleontologists engrossed, and possibly scratching your heads.

Bearing witness to almost every kill are two brothers, Nick, 16 and Gray, 10 who figure out that their parents are getting a divorce right before the mutilation and dismemberment begins. They're shipped off to 'Jurassic World' by said parents to stay with their aunt Claire, who happens to be its Park Operations Manager. Twenty two years after, no one seems to have learnt anything from the security fiasco that was Jurassic Park and it is Claire's mission to see that the park is updated with all the latest dinosaurs, because well, the CEO (Irrfan Khan) and the investors say Money = Ferocious Monster Hybrid Dinosaurs. And so the Indominus Rex is concocted by the lab coats to be the ultimate predator. Suddenly, a wild Irrfan Khan appears



Chris Pratt sweeps us off our feet with former-fat-boy charms

and tells Claire she needs to enlist the help of Velociraptor specialist, Owen to inspect the Indominus' enclosure before it opens to the public. But alas! The dinosaur tricks all of the puny humans and unleashes itself on the very same public. Now, it falls upon Claire and Owen to rescue Claire's gallivanting nephews as well as make sure that a certain manipulative military man doesn't find a way to use the situation to turn velociraptors into super weapons. Of course, there's also the escaped genetically modified dinosaur to think about.

Watch the gruesome deaths of numerous dinosaurs, security personnel, dinosaur hunters, tourists and Irrfan Khan – that shiny spark of Bollywood talent that's burning bright over in Hollywood land. Learn about the catastrophe that is greed and a few pointers in the field of dinosaur evasion. What gory glory. Mildly exciting, but fails to recreate the magic of the '90s original.

Rating: ★★☆☆☆

- Anshumala Balu

Inspiration

Animes and mangas may not be receiving the respect that they deserve, but their stories are chart topping in form of HOLLYWOOD's huge, flashy productions. If you still don't believe me, here's something that might convince you.



1. Kimba the White Lion / The Lion King

Besides the characters and the frame by frame recreation, The Lion King is so similar to the 1950's manga and anime 'Kimba the white lion', written by Osamu Tezuka, that Matthew Broderick,

the voice of simba, originally thought that he was working on a different version of Kimba.



2. Brave Raideen / Transformers

The idea of transforming robots was first seen in the 1975 in the anime series 'brave raideen'. And

then there were transformers. Coincidence? Both with a human protagonist working with the robot to fight against the forces that plan to take over earth.



3. Perfect Blue / Black Swan

The 2010 american box office success 'Black Swan' was inspired by the 1997 animation film 'perfect blue' by Satoshi Kon. Though the director of Black Swan denies it,

the number of similarities in the scenes and the characters can be no coincidence.



4. Neon Genesis Evangelion / Pacific Rim

With gigantic robots with drivers to control them, the only difference between the basic concept of 2013 film 'pacific rim' and the 1995 anime series 'neon genesis evangelion' is the number

of drivers that drive the robots and telepathic connection in rim.



5. Paprika / Inception

While most people deny copying, Christopher Nolan accepts that the machine to dive into one's brain in 'Inception' was inspired by the feature film 'Paprika'.

worldview

OUR PICK OF THE BEST TECH ARTICLES FROM AROUND THE GLOBE

(MUST READS)



FB AND GOOGLE BUILDING ARTIFICIAL BRAINS

AI is the future. At least that's what all the tech giants are believing and want us to too. Both Facebook and Google have been working on developing "Neural networks" of sorts, just like our human brains, to power their image recognition engines and the results are amazing but weird. Follow the link to find out what these two tech giants and their artificial brains are upto.

<http://dgit.in/fbgai>

THE UNTOLD STORY OF SILK ROAD

"I imagine that someday I may have a story written about my life and it would be good to have a detailed account of it." This is how the story of the biggest online drug marketplace in the history of the internet started. With its creator recently sentenced to prison for life, this Wired post will take you through the journey of the rise and fall of the multi-million dollar drug marketplace that is filled with corrupt police, murder plots and a lot of twists and turns

<http://dgit.in/silkrdstry>

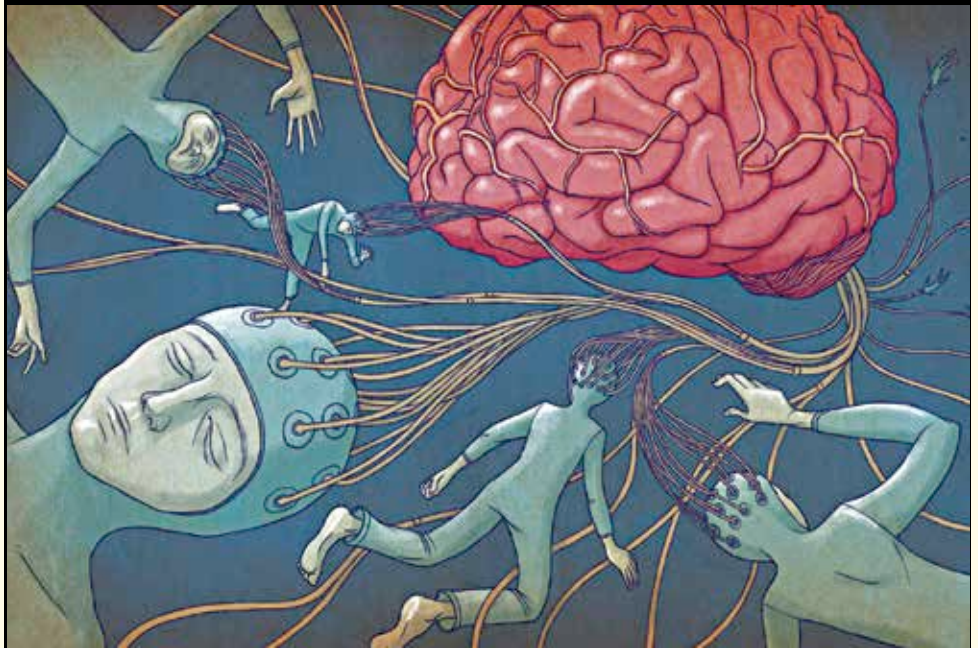
DON'T MESS WITH MS. SWIFT

Never underestimate the power of internet, especially when used by one of the most famous person. This is what Apple learned the hard way when it decided that it will not pay royalties to artists during the first three months of Apple Music.

<http://dgit.in/tylrsswift>

[Aeon Corner]

HIVE CONSCIOUSNESS



New research puts us on the cusp of brain-to-brain communication. Could the next step spell the end of individual minds? Do we really want to fuse our minds together? <http://dgit.in/joindhive>



Alien rights

The question is no longer about "if" we'll meet aliens, it's more of "when". And when that that fateful day comes, it won't be a friendly encounter nor a conquest: it will be a gold rush. Can we make sure it's ethical?

<http://dgit.in/alienethics>



The science of wordplay

Can metaphors be designed? Author Michael Erard is here to tell you that they can, and are. For five years he worked full-time as a metaphor designer at the FrameWorks Institute, a think tank in Washington, DC.

<http://dgit.in/metamanu>



The info moralist

A lot has been written about Aaron Swartz. Persecuted little guy, or powerful revolutionary – what sort of wunderkind was Aaron Swartz? Ed Lake, deputy editor of Aeon takes a crack at retelling his story.

<http://dgit.in/whodath>

STOP BLEEDING INSTANTLY

There has been an accident and people

are injured. There is blood everywhere, on the floor, on the victim, blood gushing out of the wounds. You apply a gel and the bleeding stops almost instantaneously. Read on <http://dgit.in/stpbld>

WHAT EXACTLY IS DARK WEB?

Most of the stuff you know about dark web has come from the news reports about people selling drugs there, terrorist organisation starting their own Kickstarter-isque campaigns, and the increasing child pornography. But that is just one side of the coin. Read on to find out what it is and what it's not <http://dgit.in/drkweb>

SAY BYE-BYE TO GLASSES

A scientist has invented a lens that will give you superhuman vision with just a 8 min surgery. The new lens being developed gives humans 3 times 20/20 vision, meaning that not only will it make your vision perfect, but rather enhance it to up to 3 times. If this things does what it says then you could soon say bye bye to glasses <http://dgit.in/spcleye>

WHAT IF WE HAD LISTENED TO THEM?

One fine day in the month of May 1998, 7 hackers , They were there to bring attention to how insecure and unsafe the internet was Fast forward 17 years into a world where and privacy is just an illusion, we can't help but wonder-What if we had listened to them? <http://dgit.in/lophctck>

Troubleshooting Android: the complete toolkit

Use these tools and remove Android niggles with ease

– By Kishore Ganesh

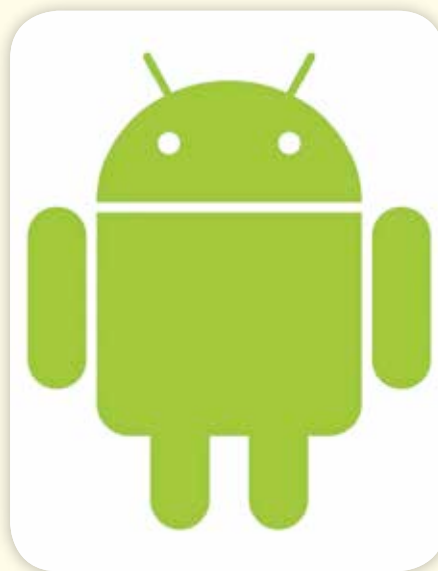
Over time, all devices start to show problems. Be it due to their aging hardware or faulty software, bugs start to pop up and you start to experience problems with battery life and performance, among other things. Thankfully, if you have an Android device, there are quite a few ways to remove these bugs or at least lessen their effects. Of course, one cannot completely reverse the bugs that occur naturally after some time, but many are fixable with some tweaks to the software. Android has a robust developer community that has tinkered with every part of the operating system, due to which there are several programs that together form a complete toolkit for troubleshooting your Android device.

ADB

Ah adb, where would we be without it? It is a part of the Android Development Kit, and thanks to an XDA developer, you no longer need to download the full kit to get adb. Now what does adb do? Well, adb is a program that, in a nutshell, can send commands to your phone. From pushing files to installing applications and many more helpful commands, adb is extremely helpful to troubleshoot your device. It can reboot your device into recovery mode, and even has a built in logging tool, which may prove to be very helpful for troubleshooting.

Fastboot

Fastboot too is a part of the Android SDK, and now is independently available. When



your device seems to be bricked, Fastboot just swoops in to save the day, with its array of troubleshooting tools. Fastboot can help flash a new recovery and other images. You can unlock your bootloader, and Fastboot has quite a few commands that can help revive your device.

TWRP

TWRP (<http://twrp.me/>) is a custom recovery that replaces your stock recovery. What's a recovery anyway? Just press the correct button combination for your device (usually volume buttons + power button) and the device should reboot into recovery mode. TWRP allows you to flash custom ROMs, root your device, backup, wipe and

restore your device, and is one of the most important tools to have if you feel like you have soft-bricked your device.

Log Collector

Just keep Log Collector (<http://dgit.in/1Q0iHnc>) running in the background, and it will log everything your phone does. Why would you want a running account of every event that happens on your phone? Well, when something like a force-close or a glitch occurs, you can scroll back to that exact event, and you can find exactly what went wrong. You can then proceed to fix the problem, and as you can see, logging makes this very easy.

Titanium Backup

A staple of a tinkerer's toolkit for the ages, Titanium Backup (<http://dgit.in/1lxOXDI>) is a godsend for those who regularly flash ROMs or are just trying to be safe. As the name says, it can back up every app and even remember individual app preferences. It is more reliable than TWRP for Apps, and has a lot of other important features, like the ability to uninstall system apps, freeze certain apps and more. You can clear up your storage, or make your apps faster with Titanium Backup. It is truly a must-have for your troubleshooting toolkit.

SetCPU

As software evolves, it requires more resources, which is why older devices



HOW BIG A WORLD CAN WE INHABITATE?

With our current population soon going to touch the 7 billion mark, the time when we will be looking for another planet to inhabit doesn't seem far away. But how big a planet will we need? More importantly what is the largest inhabitable planet that can exist for us? One man set out to find the answer to this question. <http://dgit.in/lgearth>

STRICTLY FOR THE MATH GEEKS

The site may look like something right out of the 90s but what you get there is worth it. The post, by famous mathematician Richard Elwes, consists of a list of 10 famous mathematical achievements that happened in the last 5 years and are a must read for all the math geeks out there. <http://dgit.in/math5yr>

NO MORE ANIMAL TESTING



Developed in Harvard University and recently crowned the "Design of the Year" by London museum, the Lung-on-a-chip is a device that simulates the biological process of the lungs inside you. If all goes well, then there will be no need of animal testing and human trials. <http://dgit.in/aforgan>

SCIENTIST WILL USE YOUR BUTT, POOP AND SMELL TO IDENTIFY YOU

If what these scientists are working on pans out, then in the future, fingerprint scanners will be replaced by butt scanner and the next Mission Impossible movie will see Tom Cruise coming up with a gadget to bypass the highly accurate poop scanner installed in some ultra secure facility. <http://dgit.in/buttscnr>

aren't able to cope. But there's still one trick up our sleeve: Overclocking, which can help us to get rid of the limit set by the manufacturer and let our device run unfettered. However, you must make sure to not push your old hardware too much, otherwise you may damage it. Alternatively, if your device is fast enough, you can underclock to get more battery life out of it. And this can be done using SetCPU. Download from <http://www.setcpu.com/>.

ElementalX

ElementalX (<http://elementalx.org/>) is a custom kernel for your device, using which you can customize every aspect of your CPU, from clock speed to voltage. Undervolt, overvolt or overclock, you are

sure to get the perfect mix of battery life and performance you always wanted. As devices get older, batteries degrade, but you can still salvage some life out of them by tweaking some things and getting a kernel with an efficient governor.

Safe Mode

Okay, so this isn't really an app, but a built in feature of most Android devices. By pressing and holding the Power Off option that pops up when you press the Power Button, you can boot into safe mode, where only system apps are present and all the apps you installed don't run. Why does this help? Well, sometimes one or more apps may run amok, destroying your performance and battery life. This helps you know whether the problems you are facing are hardware based or due to a fault in the apps you installed.

Ap Ops

When you are experiencing unnecessary wakelocks, i.e your device is not able to sleep properly, leading to battery drain, you need Ap Ops (<http://dgit.in/ITLV9hl>), which lets you control what permissions an app can access. You can turn off location and the 'keep awake' option for apps that don't need them, and you will immediately see a massive improvement in battery life.

GSAM Battery Monitor

The stock Android Battery Monitor isn't going to help you much to troubleshoot battery issues. GSAM (<http://dgit.in/IGxHhWe>) is a comprehensive battery monitor that can help you find out what exactly is draining your battery life.


Toolkits

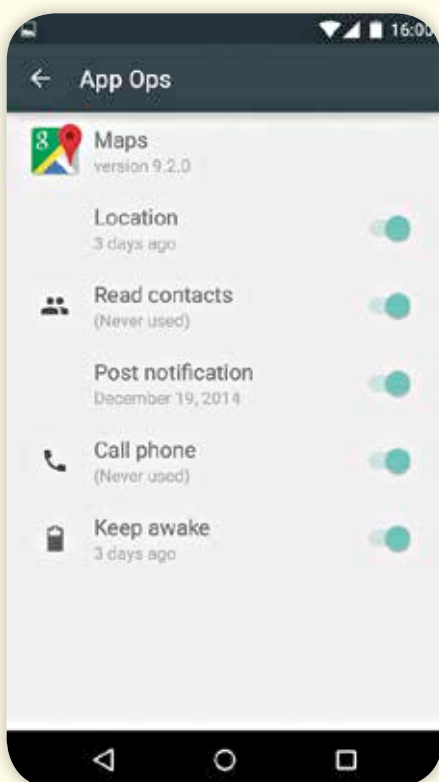
Developers have made comprehensive toolkits for popular devices. These tool-



kits are to be installed on your PC, and let you do just about everything under the sun, from unlocking to rooting to restoring your device to stock. For example, there's the Wugs toolkit (<http://www.wugfresh.com/nrt/>) for Nexus devices. You can search for your device to find a toolkit that may just be the solution to your woes.

Dead Pixel Detect and Fix

A drawback of LCD Screens, a few pixels on your phone's display may not turn on as they are supposed to, which can be annoying. Thankfully, there's a solution, but it isn't guaranteed to work: Dead Pixel Detect and Fix. It basically flashes lots of colors at once, that may just revive the dead pixels. 



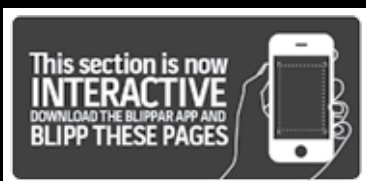
LOUDWIRE

With videos which include “10 Weirdest Maynard James Keenan Onstage Outfits” and a section of videos titled “You



think you know metal?” which might put even the biggest metal heads to shame, Loudwire is the perfect place to get your regular fix of everything rock and metal.

<http://dgit.in/ldwire>



To get all these links in one easy to read page, make sure you blip these pages from your smartphone.

(PRODUCT LAUNCHES)

MEIZU NOTE 2



Meizu unveiled the successor to M1 Note, aptly called the M2 Note, which boasts of a 5.5 display that has contrast ratio of 1000:1 and a brightness of 450 nits and is powered by an Octa core 1.6 GHz Mediatek MT6753

Price:\$130 (approx Rs. 8,500)

LENOVO IDEACENTER STICK 300



Lenovo recently entered the stick pc market with its Ideacenter Stick 300. The device is powered by Intel Baytrail CPU and will run Windows 8.1 out of the box.

Price:\$140 (approx Rs 9000)

THE HP PRO TABLET 608



HP's first tablet running Windows 10 out of the box and powered by the Intel Atom Z8500 processor. will be released in August.

Price:\$479 onwards (approx Rs. 31,000)

PICTURE PUZZLE



ABSOLUTE
TIMEPASS

UNJUMBLE
ON YOUR MOBILE



DOWNLOAD
BLIPPAR APP

FILL SCREEN
WITH IMAGE

BLIPP IMAGE
INTO LIFE!

Top 3 YouTube Picks

Make sure your boss doesn't catch you goofing off with one of these videos playing on your screen



A matter of life and death

Duration: 5 mins 56 seconds

What is the difference between the dead and living? Easy question though it may seem, it aint. Watch this:
<http://dgit.in/lif3ee>



Game or real?

Duration: 3 mins 22 seconds

Live action GTA V. Trust us this video is unlike anything you've seen before.
<http://dgit.in/riyalgta>



Is this dude a cyborg?

Duration: 3 mins 43 seconds

Declared as the world's first 'recognised cyborg', he senses colour through sound.
<http://dgit.in/cybn0t>

Introduction to gdb

>>We open your eyes to the wonders of the GNU Debugger.

Arise, awake! > by Kshitij Sobti

If you write enough code, sooner or later you'll run into a situation where just putting in print statements to figure out if there are errors won't be enough. You'll need a specialised tool to debug your code. If you're using the free GNU Compiler Collection (GCC), then there's no better tool than 'gdb', also known as the 'GNU Debugger'.

If you use Linux, chances are it's already installed and set up. But it isn't limited only to Linux and Unices. In fact, since it's open source and runs in the command line, it's been ported to all kinds of hardware platforms and operating systems.

If you're wondering why you should use a command line tool in this day and age, well, firstly, that's because it has an extensive feature set, combined with a price point of zero that's hard to match. There are GUI frontends and IDE integrations available for gdb, however, they don't include all of its features. That said, if you just



ddd is a popular GUI frontend for gdb, although at this point the interface is quite dated.

need basic debugging, such tools might work well for you.

Since the GNU Debugger is the most widely available and supported version, it's the command line that we'll look at in this article. So let's begin!

The basic gdb workflow

Before we move on to more complex stuff, let's first get the basic usage of gdb out of the way.

To effectively use gdb, you must compile the source code with debug information included. This isn't strictly necessary, and you can even debug commercial applications for which you don't have the source code.

We can now launch gdb and provide the location to your application. For instance, you can run `gdb myapp` or `gdb /home/user/code/myapp`. This won't immediately run your application in the debugger. Before doing that, you may want to do things such as set up breakpoints.

*New languages



*The programming language by Apple No one's talking about

>>Apple has been known for innovation, but one of its breakthrough that's been under the radar till now is finally getting noticed.

<http://dgit.in/applesPL>



*Google's 'Go' isn't far behind too

>>Google's home brewed language, Go, has some ambitious targets in mind with its project manager aiming to surpass Java in the next 5 years. Whoa! That's some tall order right there, don't you think?

<http://dgit.in/gogogo>



*Facebook's 'Hack' isn't doing bad either

>>Facebook came out with its own programming language based on PHP 'Hack' quite a while ago. And it is making its name in the industry. Hit the link below to know more on its recent developments.

<http://dgit.in/fbhackpl>

Once breakpoints are set up, we can issue the run command to gdb to run the application code inside the debugger. This runs the code up until the first breakpoint is encountered. At this point, we can step through the code while examining how the value of different variables change. We can step through the code source one line at a time, or even at the assembly level, one instruction at a time. We can inspect the contents of the memory and even low level registers. And then even modify memory locations, if needed.

Let's look at how to do most of these things.

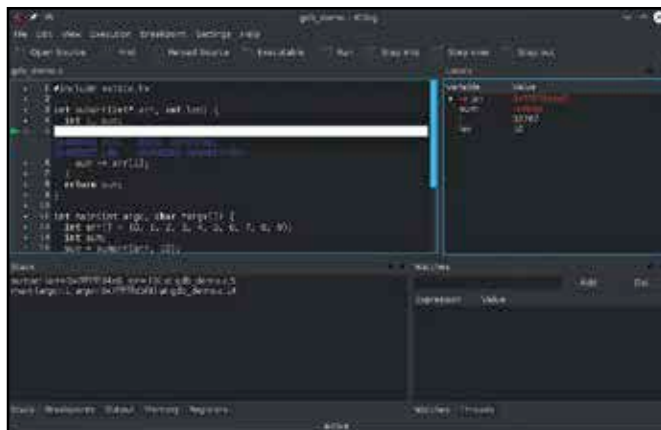
Example code

Before we start the debugging code, let's take a look at the sample buggy code we'll be using. The bugs in this code may be obvious, but remember that probably won't be the case when you're using a debugger.

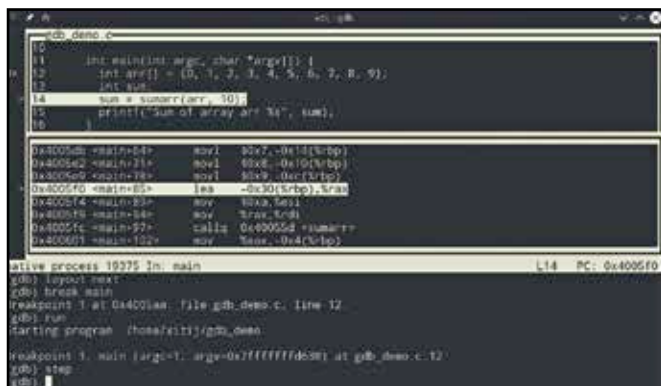
```
#include <stdio.h>
```

```
int sumarr(int* arr, int len) {
    int i, sum;
    for (i = 0; i <= len; ++i) {
        sum += arr[i];
    }
    return sum;
}
```

```
int main(int argc, char *argv[]) {
    int arr[] = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};
    int *sum;
```



Kdbg is a GUI frontend for gdb developed by KDE. It is quite powerful and includes most of the features you'd need for debugging



gdb includes a curses-based UI that might be more comfortable for some. You launch gdb in this mode with `gdb -tui`

```
*sum = sumarr(arr, 10);
printf("Sum of array arr %s", sum);
}
```

Running and viewing code

Once you've started gdb and provided it the path to your application, you can run the application by simply typing "run". This will run the program as normal, producing output, asking for input etc. You can also provide command line arguments (if any) to the run command.

If the program crashes while running under gdb, you'll notice that you get a lot more information than you would if you were running it directly. For example, it will tell you where exactly in your program (or out of it) the crash occurred, and will even display the code for that line.

If you want even more information, you can type the "backtrace" command to get the exact chain of function calls that led to the crash.

At this point if you want you can type list to list the code around this area. You can even provide list a line number and it will print the code around that line.

It can sometimes also be useful to see the assembly code generated from your source code, if the problem isn't visible at a high level. To view the assembly code for your program type `disas`. With `disas /m` you can see your own code interleaved with the assembly code generated from it. It's also a brilliant way to get familiar with assembly.

Chances are you want to pause running your application before it reaches the point that leads to a crash so you can diagnose the state of the application there. For that you need to set breakpoints, we look at those next.

Setting breakpoints

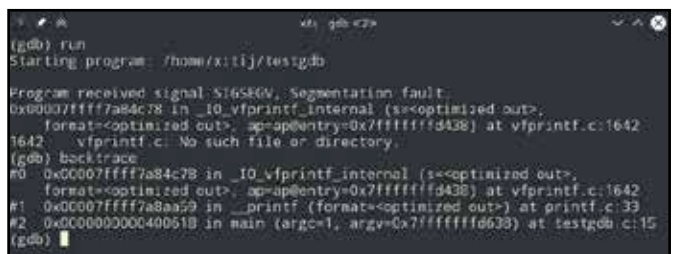
A breakpoint is place within your code where gdb will halt the automatic execution of code and turn over control to you.

There are a number of ways that you can set breakpoints. The simplest way to set a breakpoint is to specify a line number at which the code should stop executing. You can use the list command explained above to figure out what the line numbers are.

Another way to set a breakpoint is to set it using the name of the function. In this case execution halts if that function is called. `Withbreak main` you can halt execution when your program starts executing its main function.

A more interesting way to set a breakpoint, is to have a conditional break based on the state of the program. For instance you might want to halt the code if a particular variable reaches a certain value. You can specify such a break as follows:

```
break if i > 5
```



If an application keeps crashing on launch sometimes running it under gdb can give you a hint as to why.

With a good understanding of assembly, you can find bugs without even having access to the source code

This can make it much easier to handle loops, allowing you to break only after a certain number of iterations. You can also look out of cases where a variable is going out of its range.

Another related concept is that of watchpoints. With watchpoints you can have the execution of a program halt when a particular variable or memory location is modified, without worrying about what the exact value is. The way to set a watchpoint is to use `watch` keyword followed by the name of the variable to watch. For examples: `watch ctr` to pause when the variable `ctr` is modified.

Stepping through code

Once the execution of an application has paused, you might want to take it slow and go through your code one line at a time. There are number of commands for exactly this purpose, but the two most important ones are `step` and `next`, they are very similar in functionality but the difference between them is important.

Let's say we put a breakpoint on the main function using `break main` and then started the execution using the `run` command. At this point `gdb` will display the current line of code. In the case of our example program above it will be the line declaring the integer array. Now when we give `gdb` the `step` or `next` command it it'll execute this line of code, and then display the next line of code to be executed.

Where step and next differ is in now they handle function calls in your code. If you have you main function call another function in your code (like we have our main function calling sumarr) then the next will treat this like a single instruction and continue on to the next line after the function call. On the other hand, step will move the execution of the code inside the called function and let you execute that line by line as well.

Both of these commands can also take an optional numeric argument that specifies how many times the command is to be repeated. For

*pointers

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instance, step 4 will step through four lines of code at a time.

If you're inside a function, and want to quickly get to the end of the function and see the return value, you can use the `finish` command.

If you'd rather just return from the function without executing it, you can use the `return` command. Any value you specify after `return` will be the value returned from the function call.

While breakpoints halt the execution of code, you can use the `continue` command to resume executing the program till it reaches the next breakpoint (or the end of the program). If you want to continue executing the code till a particular line number use `until <line number>`.

The `step` and `next` commands execute your program one line of code at a time, however each line of code does not always correspond to a single CPU instruction. If you want even more fine tuned execution you can use the `stepi` and `nexti` commands that execute your code one assembly instruction at a time.

Inspecting program state

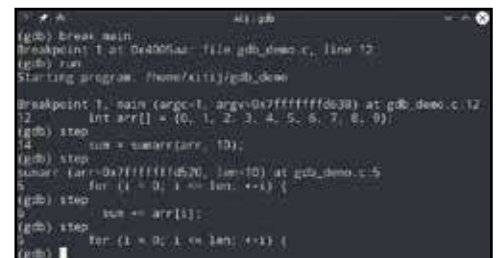
The final thing you need to know (at least for the purposes of this basic introduction) is how to actually peek into the running program and display the values of various variables.

The most important command to inspect data is the `print <variable>` command. Any variable that is visible in the current scope of the program can be printed using this command. It tries to display the variable in a format appropriate for its type. So a `char` will display as a character, an `int`, `short` or `long` will display as an integer number, while `float` and `double` values will display as floating point numbers.

It can also print character strings automatically, however for other types of arrays, you need to be a little more specific. For instance if you wish to display an array called `arr` of length 10, you can use the `print` command as one of the following:

```
print print (int[10])arr print (int[])arr
```

The third one above will try to automatically calculate the length.



Neither step not next will enter external functions like printf

```

(gdb) print *arr@10
$6 = (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)
(gdb) print (int[10])*arr
$7 = (0, 1, 2, 3, 4, 5, 6, 7, 8, 9)
(gdb) print /x (int[10])*arr
$8 = (0x0, 0x1, 0x2, 0x3, 0x4, 0x5, 0x6, 0x7, 0x8, 0x9)
(gdb) x /10dw arr
0x7fffffff520: 0      1      2      3
0x7fffffff530: 4      5      6      7
0x7fffffff540: 8      9
(gdb)

```

The large hex numbers that "x" prints in the left-most column are the memory addresses of the printed rows

If you want you can override the display format by specifying the format with print as print /format where format is x for hex, d for signed decimal, o for octal, s for string. There are more format options available.

Another command to display the value of variables is x for eXplore, which takes a memory location rather than a variable name. It can be quite useful for exploring pointers and arrays. If you provide it an address, or the name of a pointer, it can be used not only to display the value stored at that memory location, but also of consecutive memory locations starting at that location.

The full syntax for the command is x/nfu <addr> where n specifies how many consecutive memory locations to print; f is the format of the data as explained for the print command, and u is the size of each memory location. So x/5dw arr will print 5 decimal (d) words (32bits) starting at the pointer arr.

Finally let's look at the display command. Chances are you want to continuously look at the value of a particular variable or memory location after each step. Rather than using the print or x commands again and again, you can use the display /format <var/address> command. It will automatically display data using the print or x command based on your parameters each time you step forward in your code.

Conclusion

The GNU debugger is a phenomenally powerful tool, even with the basic introductory knowledge that you have gained from this article. There is of course a whole lot more that you can do with gdb.

GDB Shortcuts

Most gdb commands can be abbreviated to just one or two letters. Here are a few you might find useful:

- run – r
- step – s
- stepi – si
- next – n
- nexti – ni
- print – p
- list – l
- continue – c

Often, you need to repeat the same command again and again.

For instance, you might want to step through code a couple of times.

Rather than type "step" repeatedly, or even type "s" repeatedly, you can just press [Enter] to repeat the previous command.

```

(gdb) step
5       for (i = 0; i <= len; ++i) {
2: sum = -10896
1: i = 0
(gdb) step
5       sum += arr[i];
2: sum = -10896
1: i = 1
(gdb) step
5       for (i = 0; i <= len; ++i) {
2: sum = -10895
1: i = 1
(gdb) step
5       sum += arr[i];
2: sum = -10895
1: i = 2
(gdb) step
5       for (i = 0; i <= len; ++i) {
2: sum = -10893
1: i = 2
(gdb)

```

With each step here gdb is displaying both, the value of i the loop counter and sum

For instance, gdb can also be used to debug a program that is already running, and in fact it can even connect to a remote computer and debug programs running on it. It also supports reverse debugging. It can even record and play back the execution of applications and a whole lot more. We've only scratched the surface here but hopefully we have provided you with a good launching pad. >

*Fun Facts



*Old is still Gold

>>A list of programming languages, some of which go as far back as 1950s, which are still used in one form or the other. Maybe old is gold, after all? Hit the link below to find out what these languages are...

<http://dgit.in/isgoldold>



*A brief and absurd history of programming languages

>>Read this man's blog as he gives a "Brief, Incomplete, and Mostly Wrong" History of Programming Languages.

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*An emoji programming language

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From the lab

We take stock of the latest research from the field of battery tech. After all, we all want longer lasting phones!

What if there was never a big bang?

What are the origins of the Universe? And have we been getting it wrong?

Samir Alam
readersletters@digit.in

The Universe is a machine for creating gods.

—Henri Bergson

Pondering the nature of existence is a fun exercise. It is at once the oldest pass time and the source of the oldest scientific questions: "How did we get here? What is time? How big is the Universe? What came before everything? What is the meaning of it all?"

The entire history of human civilisation has been littered with various answers to these questions. From religion to rationality, the spectrum of thought tackling the big questions of science and humanity have led us inextricably to one answer - there had to be a beginning. In science we call it the Big Bang. But what if that isn't it? What if there is something entirely different? Something we haven't even conceived. Well it would blow your mind, wouldn't it?

Problems with the Big Bang Theory

Scientists have since been able to trace the origins of the Universe to within less than a second after the Big Bang. However, scientists can neither explain what occurred before the Big Bang nor can they theorise with any scientific reliability the nature of the universal singularity at the time of the Big Bang.

For a very long time, astronomers assumed that the Universe was composed of ordinary matter i.e. elements found on the periodic table. However, we now know that the density of ordinary matter only constitutes 4 per cent the Universe's total

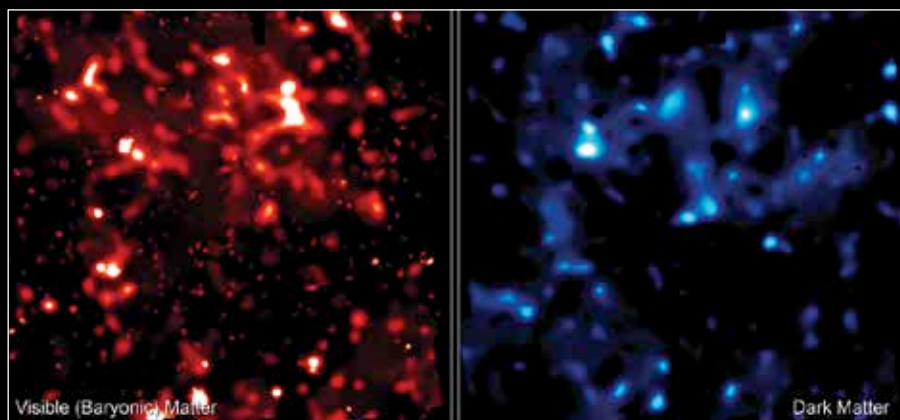
energy density. Of this, the stars (Hydrogen and Helium) are about 3.97 per cent, and all other heavier elements (planets, asteroids, etc., across the entire universe) a mere 0.03 per cent!

The remaining 96 per cent is made up of 23 per cent dark matter and 73 per cent dark energy. But what is dark matter and dark energy? To be honest, no one really knows. Read more about it and String Theory in this month's dmystify book.

Five dimensions?

A team of three researchers has floated a theory about the origins of the universe that challenges the traditional understanding of the Big Bang. Niayesh Afshordi, Robert Mann

black hole would also have a event horizon that cloaks it from revealing any information just as in our universe. But unlike a 3 dimensional black hole that has a 2 dimensional event horizon, a 4 dimensional black hole would have a 3 dimensional event horizon. According to these researchers our universe is actually this very 3 dimensional event horizon surrounding a 4 dimensional black hole. And just as a 3 dimensional blackhole's singularity is hidden by the 2 dimensional event horizon, so is the 4 dimensional singularity hidden by the 3 dimensional event horizon (our universe) which makes the cosmic big bang of our universe completely impossible. A brain twist, isn't it? Take a moment to read it all again.



Dark matter isn't known but its gravitational effects tell us something is there.

and Razieh Pourhasan have created a model of the universe wherein the Big Bang was in fact the implosion of a four dimensional star in a five dimensional universe. And the Universe as we see it is nothing more than the cloak or wrapping around its singularity in three dimensions. Just as a black hole's singularity is perceived to be two dimensional while in our four dimensional universe.

In their causal scenario, in a universe of four spatial dimensions (instead of our three), a four dimensional blackhole would originate in the same way due to the converging effect of gravity. This 4 dimensional

Now before our collective brains explode with the idea of a five dimensional universe, consider the following - humans are used to the three spatial dimensions of length, breadth and height. Adding to it the dimension of time, we can establish that we live in a four dimensional universe. But what if there was another spatial dimension that we weren't capable of perceiving? In this model of four spatial dimensions (with time as a fifth) the researchers have proven, at least mathematically, that the new idea fits better with our observations of the cosmos than the idea of the inflationary Big Bang. The



The hunt continues

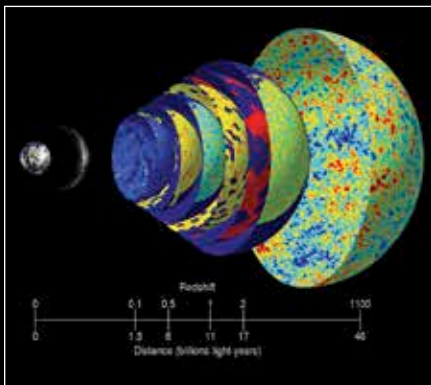
The Large Hadron Collider resumes its search for more unknown particles. Read on <http://dgit.in/lhcworks>

Space Age

mathematics behind this explanation has already been vigorously tested and is part of a field called holography.

Unlike the popularised understanding of holography such as in holographic displays, the study of the holographic principle is related to string theory and quantum mechanics. It studies the properties of strings and is also related to the study of quantum gravity.

Fortunately, like any good scientific theory, the theory of multi-dimensional brane universes is easy to test. Since the fourth dimensional matter would undergo thermal fluctuations due to the four dimensional black hole it would register as small but noticeable distortions in the cosmic microwave radiation - a change we can observe and measure. If these distortions aren't in line with the new theory, then it would mean the new theory is wrong. Other



Cosmic microwave background radiation lets us observe the very origins of the universe.

similar aspects of the new theory can be tested and measured proving its veracity. All it takes is a little time and a really big cosmic radiation detector. We'll know soon enough if this theory is right or not.

Ad infinitum

While the theory of a five dimensional universe takes a while to digest - what about the theory that the universe is infinite in age with no beginning or end? In another competing new theory that is coming to the attention of scientists the currently accepted age of the universe - 13.8 billion years - may be off by, well, an infinity or so. According to this new model which uses quantum corrections within Einstein's theory of general relativity, we find an elegant answer to


mysteries such as dark matter, dark energy and so much more.

The new model was postulated by Egyptian scientist Ahmed Farag Ali and Indian scientist Saurya Das. These two researchers used the foundation work of 1950s theoretical physicist David Bohm to replace the use of classical geodesics (shortest path between two points on a curved surface) with the newly developed method of quantum trajectories between two points. They applied the quantum Bohmian trajectories to an equation by physicist Amal Kumar Raychaudhuri of Presidency College in Calcutta to arrive at their final model explaining the design of the universe.

Within their mashup work, by combining the ideas and approaches of geniuses across the world and time, the duo of Ali and Das was able to derive an equation which described the expansion and evolution of the known universe. Their equation combines the properties of quantum theory with general relativity which are expected to hold true, if and when a unified theory of quantum gravity is discovered.

Using the new variables and factors in their equation, as a representation of the universe, these scientists have posited that the universe is of a finite size. This conclusion also has the natural corollary that the universe is of an infinite age implying that time has neither a beginning nor an end. The reason this theory really holds up is because it is consistent and closely congruent with the most recent observations regarding the density of the universe and the cosmological constant. So far it seems to check all the boxes making it a likely contender for the universe's origin story - which is that it has none.

Unquenchable thirst

The nature of reality is perhaps impossible to discover. What came before the big bang? Perhaps we will never know. Was there a big bang? We might be able to answer that eventually. What does it all mean? We don't know, and perhaps never will. That's not going to stop us from continuing to ask questions, and when every answer throws up a whole new set of questions, you can bet humanity is going to thirst for answers for a long, long time to come. 



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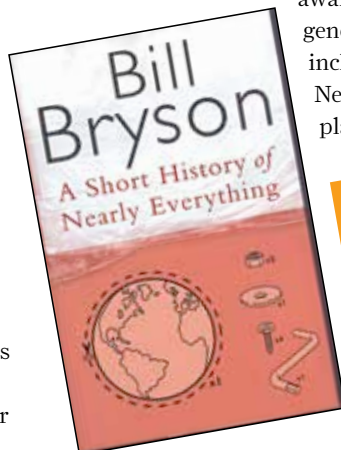
Ronak Gupta

readersletters@didgit.in

Books in the popular science genre have the unique ability to awe, thrill and inform at the same time. In today's application driven world, Science books can give us the highly underrated pleasure of discovery along with a slice of history. In this article, we list down science books everyone should read. The books on the list have a timeless quality about them – they're lucidly written and brilliantly researched making them not only good popular science books, but great reads in general.

1 A Short History to Nearly Everything by Bill Bryson

If you go through any list of popular science books, odds are that Bryson's wonderfully written book will be at the top of the list. Bill Bryson is known for his travel writing in which he displays a brand of humour peppered with anecdotes. Because Bryson isn't trained as a scientist, his approach is fresh making this book read less like a drab description



of a scientific concept and more like the account of a curious kid amazed by the grandeur of science. The book touches upon areas of science ranging from microbiology to cosmology and never once loses grip of its motive – to generate genuine interest in science. Bryson gives us accounts of famous personalities in science and talks about their oddities. He attempts to show the range of sizes in science to scale by using comparisons. Garnering multiple awards and inspiring generations of kids (ourselves included) 'A Short History to Nearly Everything' deserves a place on every bookshelf.

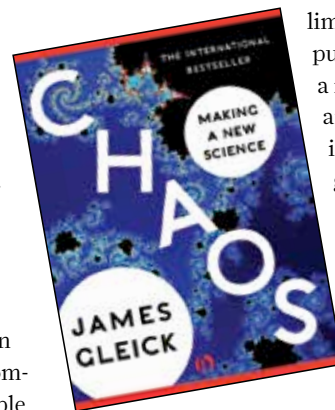
2 Chaos by James Gleick

Chaos theory gained acceptance fairly late compared to other heavy-weight theories such as Quantum Mechanics and Relativity, but grew

rapidly in popularity. A term often used to describe the theory is 'Butterfly Effect', which underlines that a butterfly

flapping its wings can cause a hurricane on the opposite side of the Earth.

This theory was brought into limelight in 1987 when Gleick published 'Chaos'. Gleick is a masterful science writer and historian, and this book is a brilliant example of his genius. He begins by giving us an account of time when chaos theory was one of those neglected theories, shunned by the bigwigs of science. The book is a story of the bravado and triumph of those



unheralded scientists who dedicated their careers to unravelling the mysteries surrounding a theory that today is critical in predicting weather and understanding patterns in various physical systems. The book made "Butterfly Effect" a household term and is largely responsible for introducing the concepts of chaos theory and fractal geometry to a broad audience. Chaos theory is now a staple in pop culture and even played a large role in Michael Crichton's bestselling book, 'Jurassic Park'.

3 The Perfect Theory by Pedro Ferreira

Cosmologist Pedro Ferreira's book is the definitive biography of Albert



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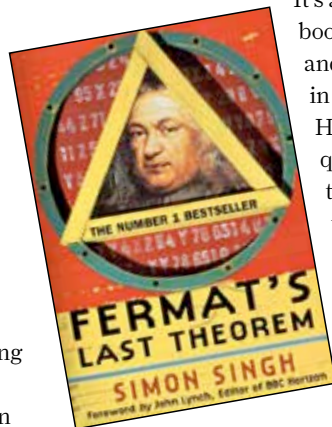
Feature

Einstein's theory of general relativity. Considering that the subject matter is difficult to explain and has been written about plenty of times before, there's a certain novelty to Ferreira's approach. He talks about the events that led to the development of the theory and describes, sometimes in detail, the great personalities that pioneered its use. The book also dives into the implications of the theory, which are grand to say the least. Einstein's field equations helped scientists discover the very fabric of the universe, the lives of stars and stellar objects and the mysteries of black holes and other singularities in space-time. While this book might be a bit too heavy for the general reader, it's practically gold dust for anyone who has ever wondered why the theory of general relativity is the most revered theory in the history of physics.

4 Fermat's Last Theorem

by Simone Singh

Based on a theorem in number theory that was unproven for more than 350 years, 'Fermat's Last Theorem' is a story of one man's obsession with proving it. Simone Singh excels at telling the story of Princeton mathematician Andrew Wiles, who struggled for close to six years to solve a long standing problem in mathematics. We're sucked into Wiles' tumultuous journey full of ups and downs as he finds a chink in his proof and then proceeds to finally correct it. The book is gripping and never loses pace, which is surprising since it's based on a theorem in pure mathematics. While the title may dissuade most readers from picking up this book, we strongly recommend it. It's a gripping story told with the right amount of detail and an almost infectious enthusiasm.



5 A Brief History of Time

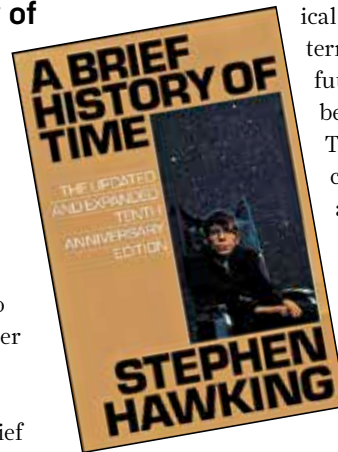
by Stephen Hawking

Stephen Hawking is hands down one of the most popular physicists ever. Not only is he a brilliant genius, he's also a fantastic writer and this book is an example of both. 'A Brief History of Time' paints a large canvas of the cosmos of which the earth is just the tiniest fragment. Discussing the possibilities of time travel

and existence of wormholes, Hawking touches upon topics bordering on meta, such as the beginning of time itself.

It's a wonderful book, short, crisp and powerful in its own right. Hawking frequently uses pictorial representations to explain complicated concepts such as particle spin and almost no equations. He writes with flair and brings in his traditional British

humour and excellent scientific insight, making it a satisfying read.



ical future on Earth. What's terrifying though is that the future he describes may not be hypothetical after all. The landmark Copenhagen conference set the tolerable limit for the rise in global temperature to close to 2 degree Celsius. At that tipping point, some countries would flat out disappear. In an almost countdown-like fashion, Lynas breaks

down the effects of global temperature rise degree by degree. He sieves through scientific evidence including research papers, investigative reports and computer simulations to present a clear and concise account of how global warming can literally change the face of Earth.

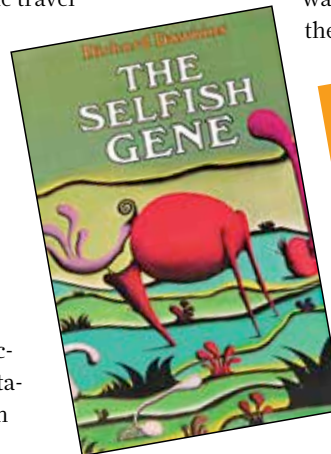
7 The Selfish Gene

by Richard Dawkins

'The Selfish Gene' has influenced many debates and shaped scientific pop culture by introducing revolutionary ideas – relevant even today, almost thirty years after first being

published. Among other things, Dawkins, in the book, coined the term 'meme' to describe a unit of human cultural evolution that encompasses all of human culture, fashion and fads and quite analogously like a gene is selected

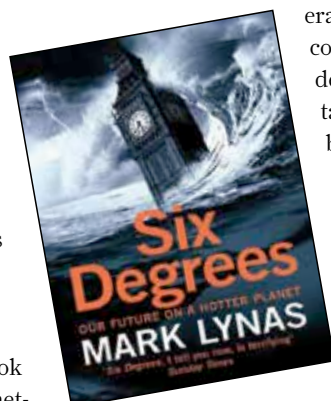
and passed from one generation to another. Without concentrating on scientific details of genes, Dawkins talks about the role played by genes in evolution. Using an approach frequently referred to as 'reductionist', Dawkins presents the idea that genes control the future by controlling information transfer and that organism exist simply



6 Six Degrees: Our Future on a Hotter Planet

by Mark Lynas

The IPCC (International Panel on Climate Change) has claimed that Earth's global temperature could rise by upto 6 degree Celsius at the end of the century. Lynas' book deals with mankind's hypothet-



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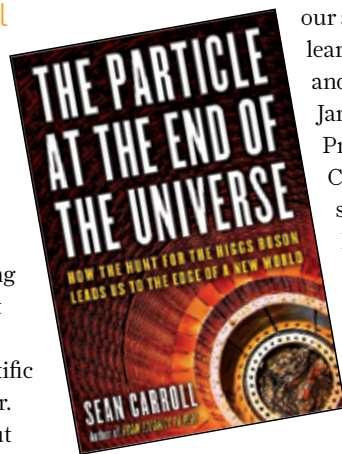
A teenager made a laser gun with a combined power of 40W. Check it out here: <http://dgit.in/1KSIdR3>

as survival machines acting as a sort of carriers for these genes. Dawkins's ideas are radical, to say the least, and led to much criticism but there's no denying the fact that his book, *The Selfish Gene* is an important contribution to socio-biology. In a time when not much was known about genes and DNA specifics, Dawkins presented a model to explain evolution of animal intelligence and altruism.

8 The Particle at the End of the Universe

by Sean Carroll

This book by Sean Carroll talks about the elusive Higgs Boson, the fundamental particle that gives all matter mass. Carroll is an accomplished physicist and blogger and does an excellent job dealing with some complex subject matter, coming up with a thrilling account of a scientific pursuit rivalled by no other. Carroll writes not only about the ideas and theories that predicted the Higgs Boson – discovered at the Large Hadron Collider (LHC) in 2013 – but also the amount of lobbying and politics that were necessary in securing funding for the expensive experiments. He addresses why the search for the particle is an important one and how it adds another piece in the jigsaw of discovering matter. Carroll knows how to condense the subject to the right amount. He explains the basic physics in a way that's never too heavy for the general reader.

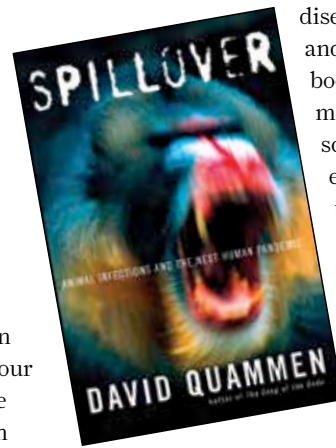


entertaining read, the book delves into the collapse of preceding civilisations such as the Mayans and the developers of the Easter Island statues. Diamond then discusses the factors that lead to the collapse of a society in general and the ability of such a civilisation to self destruct. Diamond, an optimist, also remarks that our civilisation, unlike our ancestors, can learn from mistakes and a collapse can be prevented. Jared Diamond is a Pulitzer Prize winning author and *Collapse* is a brilliantly constructed piece of work. Jared Diamond presents his arguments along with examples and historical evidence. Rather than rely on the generality of the causes of collapse, he notes that all problems don't fit into one framework. One of the longer and heavier books on the list, *Collapse* however has enough content to intrigue you while keeping you captivated and informed.

10 Spillover

by David Quammen

'Spillover' is one of those books from the science genre that has the pace of a typical airport novel. In his thrilling book, Quammen talks about a class of diseases called "zoonotic diseases" that are animal infections and can be passed on to humans. SARS and HIV are two high profile examples of such diseases. *Spillover* is sprawling in scale and scope, but at its heart has a couple of important and ultimately terrifying questions. How do these zoonotic



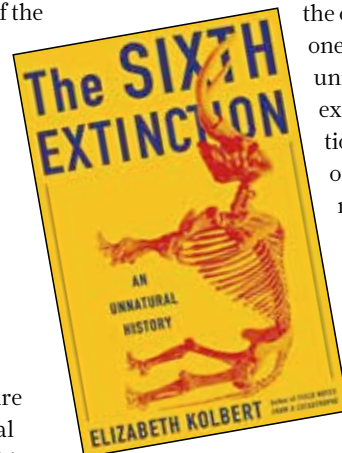
diseases emerge and spread, and what's next? Through the book, we travel across the globe meeting microbe hunters and scientists on the way. It's an exciting and scary ride to say the least. While Quammen doesn't write about dense biological details, he never oversimplifies concepts. The narrative is gripping, and we're presented with anecdotes and stories about people working

(very dangerously) in the field, dealing with deadly diseases as a part of their profession. *Spillover* has the look and feel of a science fiction book. Alas, zoonotic diseases are real and alive.

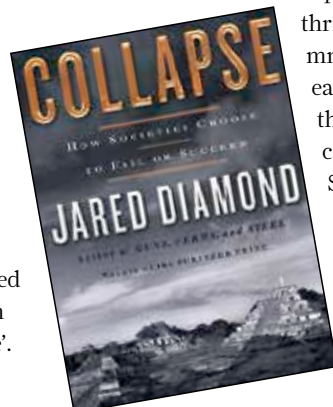
Bonus The Sixth Extinction

by Elizabeth Kolbert

Earth's history has been marked by five mass extinctions that led to sudden depletion in the diversity of living species. 'The Sixth Extinction' refers to the ongoing current one, the one caused by humans, the unnatural one. This book examines the previous extinctions and looks at the current one through a bleak and grim microscope. The author visits sites where species have been wiped out and talks to experts in the field. It's an important book that everyone must read to fully grasp the extent to which humans are



degrading nature. As ecologist Paul Ehrlich quotes, "In pushing other species to extinction, humanity is busy sawing off the limb on which it perches". Kolbert writes in an almost poetic fashion, and the prose is entertaining and beautiful at the same time. The book unfolds in the fashion of a travelogue that carries a clear and concise message and an urgent warning. Although the content presents a highly pessimistic view of the current state of affairs, it's a must read for anyone who's had even a fledgling thought of helping conserve nature's bounties. **[1]**



9 Collapse

by Jared Diamond

How did societies in the past collapse? What are the factors leading to the collapse of entire civilisations? Are we in danger of collapsing as a society? These are the questions Jared Diamond aims to answer in his brilliant book, 'Collapse'. Almost written as multiple books combined into one



Bikes that don't crash

Ducati has developed a system that ensures their bikes don't crash as much as possible. Read more: <http://dgit.in/dcaticrsh>



The apple is for everyone

Apple is making Swift, their programming language, open source for iOS, OSX and Linux. <http://dgit.in/applopen>

From the labs



More juice please

With portable battery-powered devices still ruling our lives, it's about time we cracked the battery code. Will we ever measure battery life in weeks and years instead of hours?

Lavleen Bhati
readersletters@digit.in

Since the 18th century, when man first discovered how to harness static electricity using metal electrodes and saltwater, the quest for improving batteries has become an important field of study for many. From those days of yore, battery tech has undergone significant improvements, however, the basic chemistry remains the same. A basic battery today contains three major parts: the anode, cathode and separator (also known as “electrolyte”). The anode and cathode provide the electrons that conduct electricity, while the separator

facilitates the reaction between the metals at both ends of the battery, i.e. the anode and cathode. In the search for better batteries, the only thing that has changed is the material used for the cathode, anode and separator.

Science and Technology, on the larger scale, has made tremendous strides. We have laptops, smartphones and tablets that are many orders of magnitude more powerful than the first computers invented. And the best part: they're not devices that are locked to a wall plug. Thanks to batteries, they're portable and we've come to depend on them. Imagine the world today with landlines instead of mobile phones!

Over time, more device categories went portable. However, along with becoming more powerful, they've also gotten more power-hungry. Batteries meanwhile are still playing catch up. Better performing batteries with longer life continue to evade us as we rush to find the nearest plug point to recharge this much needed life force at the most inopportune times.

In search of the ultimate battery

Meanwhile, scientists seem to have gone through nearly all elements on our periodic table to find more viable and efficient metals for use in batteries. Is the battery that we use today in our laptops and mobiles the ultimate battery?

These scientists are now trying to improve on the widely used battery of today – the lithium-ion battery. This is one line of work. Yet another group of researchers is trying to develop rechargeable batteries that will harness the power of nature by way of sound, light and even our own muscles. Others are trying to make devices more power efficient.

Whatever be the method and approach, all these endeavors converge into one ultimate goal – developing methods to let us work seamlessly without having to worry about running out of battery.

Batteries of the future

The lithium-ion batteries that we use today feature lithium cobalt oxide as the cathode and carbon as the anode, separated by a very thin sheet of microperforated plastic. Lightweight and with high power density, a Li-ion cell produces a voltage of 2.7 volts, which is much higher than a normal AA alkaline cell, making it right choice for use in mobile devices. However, there are a few downsides to Li-ion batteries. They begin degrading as soon as they leave their manufacturing factories, are extremely sensitive to high temperatures and might burst into flames on failure.

Thus, arises the need for batteries that can overcome these disadvantages while increasing power density. Let's take a look at some of the research underway to improve battery tech.



3 floors a day

A chinese businessman built a 57 storey building in 19 days. And that's not all he plans on doing. Read on: <http://dgit.in/57storey>

Who guards the guards?

One of the world's leading Anti-Virus company, Kaspersky was the target of a recent sophisticated cyber attack. <http://dgit.in/1MKUId>



Our devices are more power-hungry

• Designer Carbon

In their attempts to improve battery life and performance, scientists have come up with a new pattern of carbon electrodes that is said to boost a battery's performance. The 'designer carbon', that's versatile and controllable, has been developed by scientists at Stanford University, and is said to have exceptional energy-storage capacity, which will take the performance of the lithium-sulphur and other batteries to a whole new level.

Made by heating coconut shells to a very high temperature and then chemically treating the result, this new activated carbon has pores and holes in it leading to greater surface area to store more charges and catalysing more reactions.

The only drawback of this 'designer carbon' is the limited connectivity between pores, which may limit its ability to conduct electricity. However, it's gaining more popularity with each passing day as people are trying to use them to create new batteries with high power density.

Lithium sulphur batteries are said to benefit the most from the introduction of these electrodes which use chemical reactions between lithium and sulphur to produce power, are lighter than lithium-ion batteries and much more power efficient.

• Metal-Air batteries

These work due to the reaction between metal and oxygen and use a porous carbon electrode to trap the ions and catalyse the reaction. Their efficiency depends on the metal used and its reaction with oxygen. Some such batteries are:

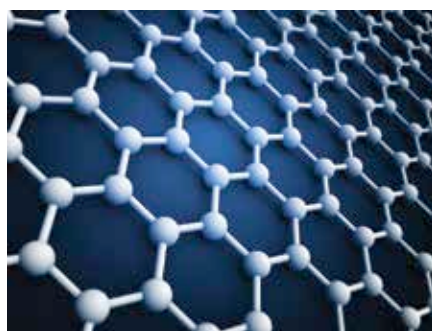
1. Lithium oxygen battery: These bat-

teries are lighter in weight compared to the lithium-ion batteries since the oxygen used is taken from the environment and need not be stored in the battery. These batteries provide greater power density due to the porous carbon cathode.

The produced lithium oxygen compound deposits on the carbon but doesn't form a lattice with it, making it easier to recharge.

Its drawbacks are the use of lithium itself. As Li is extremely reactive, it must not react with the electrolyte while in contact with it. Also H₂O and CO₂ enter the battery along with Oxygen and form compounds that prevent regeneration of Li on recharging.

- 2. Sodium air battery:** These batteries use sodium metal, and are more efficient than their lithium counterparts, but are less energy dense. They can be recharged to 93% efficiency and are cheaper than the lithium air batteries. Lithium, being highly reactive, converts to Li₂O₂ on reaction with oxygen which makes it harder to recharge it. Sodium, on the other hand, forms Na₂O as the major product on a nanoscale, which is easier to decompose, thus making it more efficient
- 3. Aluminium oxygen battery:** Some people claim that aluminium air batteries are the ultimate alternative to the lithium-ion battery as aluminium is cheaper, lighter and less reactive. Also, aluminium produces three electrons on ionising as compared to lithium, which produces only one electron, giving it higher charge capacity. However, because of low discharge voltage the battery possesses a shorter lifetime than lithium batteries.



What is the best material to make batteries

• Graphene wraps

By wrapping sulphur with a thin flexible sheet of graphene, scientists are trying to the battery of the near future. Graphene, with its high conductivity, increases the speed of electron transfer in the batteries, thus increasing its capacity.

• Microbatteries

Microbatteries, as their name suggests, are very tiny batteries and the development of these microbatteries is another growing field.

Scientists at the University of Illinois at Urbana have created a microbattery that could charge 1,000 times faster than a regular battery and, as claimed, can fit in and power a credit card thin device.

• Semi-liquid battery

Considered semi-liquid due to the liquid ferrocene electrolyte, liquid cathode and a solid lithium anode, this battery, developed by researchers at the University of Texas at Austin, has working voltage similar to that of a li-ion battery. Its power density is comparable to that of a supercapacitor, has good energy density, high capacity and a capacity retention of 80%.

The reason for its high power density is said to be the high speed of ions in a liquid medium as well as the increased speed of electrons.

Power-efficient devices

Besides trying to improve the batteries, devices that use less power (thus increasing their battery life) are also being researched. Technologies that can make your device last longer can already be found around us.

• Ineda Systems

A new chip, created by the startup company Ineda Systems, works alongside the main processor in a device to perform various functions while allowing the main processor to spend much of its time powered down, thus saving energy. This chip has two or three cores, one of the which always operates with low power consumption. The other core/s will consume more power, but will switch on only for heavier tasks.



Astronomers rejoice!

The construction of the world's largest telescope is finally under way. Read more about the Giant Magellan Telescope here <http://dgit.in/lrgscope>

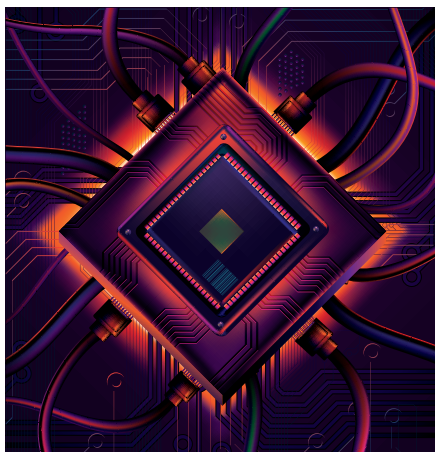
Choose the perfect handle

Want a l33t name for your online persona but k00lguy6969 is already taken. This will help you select the perfect handle <http://dgit.in/1RMjCBx>

From the labs

• Eta Devices

Eta devices have tried to reduce power consumption by developing a new design for amplifiers. Power amplifiers use power while sending digital data in two modes: standby and the output signal. This new design will lower the amount of power consumed in standby mode, while preventing the distortions in the digital signals that occur when moving from the low power standby mode to the high power output mode. While the design is still being lab-tested, the company aims to target the smartphone market soon. The main focus is its work on a smartphone chip, which will ultimately lead to a single power amplifier that can handle all of the different modes and frequencies used



Power efficient devices are the next step

by the various global standards. Once this tech is widely available, we can soon expect to find smartphones that consume half the power they're consuming today.

• Intel

Merrifield and Moorefield, two new Atom chips announced by Intel, promise faster performance and better battery life by powering down quickly after executing a task and are designed to work with many different operating systems.

• SAM L21 32-bit ARM family of microcontroller (MCUs)

Atmel, the San Jose-based company, introduced the new SAM L21 32-bit ARM family of microcontrollers, that consumes less than around 35 microamps of power per megahertz of processing speed while

active, and less than 200 nanoamps of power when in deep sleep mode.

Though this still isn't sufficient to run an Ubuntu desktop, it has enough computing power and memory to run a real-time operating system with multiple programs, handle physical interfaces and stream media from a USB device or other external storage.

• Texas Instruments

Texas Instruments (TI) is developing chipsets for chargers that will increase the charging speed of your battery by almost 30%, which will in turn help increase the overall life of your battery. In short, you can expect a year-old battery to perform the same as a new one. TI's system should work with any standard lithium-ion battery in mobile phones today.

Eliminating batteries

What if you had access to technology that would eliminate the need for batteries?

Ever thought of technologies that can power your devices 24x7?

Questions like these have fostered inventions as the following that will eliminate the need for storing power.

• Self-powered devices

Researchers from the Imperial College London are trying to create self-powered devices. By creating a material that can power devices, they expect to create the entire outer shell of the device with that material so that it can be powered by its body. Researchers are working to make it more durable, light-weight and energy efficient while still being cost effective.

• Wireless charging

With the increase in the number of wireless chargers, Ossia has added another one to the list, and it looks exciting. Ossia's 'COTA' technology can charge devices upto 30 feet of distance away via Wi-Fi or Bluetooth. The system needs a receiver and a charger. Once the receiver detects the charger, it sends signals to charge the device. It is not only inherently safe, but also highly efficient as the tracking beacons use only 1/10000th of the Wi-Fi's power and avoid anything that might absorb energy.



Natural batteries might be the answer

Natural charging

Yes, we have been using solar, wind and other natural sources of energy to power our houses for a while. But scientists are now working on using these to directly power our devices.


• Heat to electricity

MIT engineers are creating devices that can convert heat energy to electric energy. They can help charge our batteries with a temperature difference of 20 to 60 degree Celsius. Not just MIT, many others are also working towards the same goal and if it works out, batteries won't need to be plugged in for charging ever again.

• Smart clothing

We carry our phones in our pockets. What if our pockets could charge our phone? Researchers are trying to integrate carbon atoms into different types of yarns that will be used for making clothes. These smart clothing will have external powers and processing while only the sensors will be embedded in the clothes. Supercapacitors will be used to power the garments, and the sensors and touchscreen will power our phones.

• Muscle power

Nowadays, flexible nanogenerators are using our body muscles to power our batteries. A nanogenerator is a small, stamp-sized patch that attaches to your skin and converts the energy produced by muscle movements to electrical energy, which can then be used to power various devices. 

Smartbands

We scour the wearable landscape in India and compare some of the top wristbands

Bazaar

All the latest and greatest products tested and reviewed so you make an informed buying decision

LAPTOPS ON A BUDGET



When you have around 40k to spend on a laptop, which one do you go with? We test laptops from Acer, ASUS, HP, and Lenovo to tell you just that...

Jayesh Shinde
jayesh.shinde@9dot9.in

Somewhere around the middle of every calendar year, laptops start getting refreshed to newer platforms, and manufacturers start rolling them out for consumers to purchase. It's also the time when students and young professionals are buying laptops, based on the flurry of emails asking us for laptop recommendations under 30k and 40k. Through this feature, we aim to address most of your concerns, dear reader,

and give you some compelling options to consider for your next budget laptop spend.

It's good to see Intel's 5th generation Core i3 processors being available on laptops selling under the 40k mark, something that we saw on a couple of laptop brands in this comparison. The latest iteration of Intel chipset is good for boosting the laptop's battery life more than anything else, and good to see those SKUs available at an affordable price point. We also received an AMD-powered laptop for review after a long long time,

because we always wondered how good are AMD's APU compared to low-powered Intel Core i3 units. No need to wonder anymore, as you'll see the result for yourself in the mag table of this comparison. Other trends seen in this comparison are the fact that 4GB of RAM and 1TB of hard drive has become pretty much the defacto for laptops selling over 30k, which is a great revelation. Also, almost laptops we tested here come with some sort of cloud data solution (either by partnering with Microsoft OneDrive or their own propri-

etary service), and this is a great value add for consumers.

We received laptops from most leading brands in the market, especially given the price restriction we had placed on them when we requested for review units. Acer, ASUS, HP and Lenovo wasted no time in getting units to us. We received 12 units in total, but had to drop machines from Acer, ASUS and Lenovo for either not fitting the criteria (price-wise) or malfunctioning during the process of our testing. We tried very hard to secure a Dell budget laptop to feature in this comparative



How daredevil sees?

Ever wondered how Daredevil climbs buildings and fights bad guys without his eyesight? This video might give you some insight <http://dgit.in/daredevilsees>



WakeAndBake

what happens when 3 college students decide to start a startup called WakeAndBake? Find out: <http://dgit.in/1H3rXOh>

Budget laptops



review and to give our readers a great overall view of how good or bad Dell laptops compare to the competition. However, despite repeated attempts and waiting for over a month, we failed to get any Dell laptop. We still haven't received a unit at the time of going to print. Nevertheless, though, dear reader, we are on course to reviewing the machines that we couldn't in the next issue. So stay tuned for that. For now, let's see how these six budget laptops stack up against each other.

TWO ACERS

None of the laptops tested in this test are bad or not recommendable, and that's true even for the two Acer laptops which hit all the right check marks but didn't do much to separate itself from the pack. The Acer Aspire range continued to impress us with their E5 range of laptops, and we got two promising candidates from their stables. The fact that surprised us most about these two machines is that right out of the box, where

HOW WE TESTED

Initial setup: We tested these budget consumer laptops much like any other laptop we benchmark. All laptops to be tested are first examined and everything about them is catalogued, including bundled software, accessories, etc. We then completely wipe all data on the laptops and install a copy of the Windows 8.1 Enterprise Edition. Drivers and essential software are installed from the manufacturer's website before running Windows update. This is done to ensure that the laptops don't have any bloatware or trivial apps, only essential drivers that will help the device's hardware to run at optimum performance without any software bottlenecks. Finally, the devices are set to run in performance mode in the BIOS as well as in the power options. All performance inhibitors are turned off, as much as possible – stuff like hard drive idling to sleep, screen switching off, screen dimming on battery mode, etc. After this, the laptops are ready to go into the grinder of our performance benchmarks.

Performance tests: We conduct a whole series of tests on the devices to measure the impact of every aspect of the system on overall performance – tests that stress the laptop's CPU, RAM, GPU, hard drive, screen, thermals, battery, and more. These tests include industry standard benchmarks including (and not limited to) Futuremark's PCMark 8 and 3D Mark, MAXON Cinebench, and others. We use PCMark 8's Creative test suite to evaluate battery life of each laptop, as well. Results are carefully catalogued.

Screen brightness and contrast ratio is measured using the DataColor Spyder 4 Elite test unit – a color calibrator. It's essential to calibrate all laptop displays before objectively testing them, and we do just that. In dark rooms with little or no ambient light, the laptops are tested with Datacolor Spyder Studio. Brightness and contrast is tested at different luminance level, and an average of multiple readings is taken as the final score. We also test the screen's gradient through DisplayMate and Lagom.nl.

A series of subjective testing is also conducted that scores aspects such as a laptop's keyboard, touchpad, palmrest, screen readability, onboard speakers, look and feel, watching movies, playing games (if the laptop is meant for gaming), among others. These tests help complete the gamut of objective benchmarks with real-world test scenarios, allowing us to take a fairly homogeneous look at the laptop's overall performance.

The final performance score is arrived at which includes the weighted sum of all the scores

catalogued. Weights are assigned based on the perceived importance of the components. For example, since gaming doesn't really matter or is all that important on a business laptop, gaming benchmarks and scores from them are of lesser importance here than they would be on a home entertainment or gaming laptop. Stuff like battery life, screen brightness, CPU performance will be of significantly greater importance in a business setup.

Features score: The features present in each laptop are tabulated and given weighted scores depending on perceived importance. For example, dedicated multimedia keys and volume keys are given more weightage than those that are shared with Fn keys. An important note on features, we don't rate CPU, GPU, RAM characteristics any weight here, because we feel those characteristics already surface in the performance part of our testing. Example - Whether a laptop has a dual-core or quad-core laptop doesn't get lesser or higher points because both of these laptop's performances take those aspect into account. Features that directly impact performance are not counted or scored here.

Design and Usability: The scores for this parameter are largely subjective as they indicate our experience with the device. Items such as quality of the keyboard, responsiveness of the touch-screen, etc. are weighed and scored.

Final score: The final score that we arrive at is the sum of the performance, features and design scores with a 30%, 20% and 20% weightage, respectively. This is not a fixed weightage, and depending on the category of laptops we're testing, these weightages can be different.

A note on winners: The Best Buy laptop is awarded to the device with the best price to performance ratio based on a pre-determined formula. This is the ideal, value for money product in the test. The Best Performer award is awarded to the device with the highest overall performance score. The Editor's Pick award is awarded to the device that the reviewer feels is the best product that offers something extra or unique that none of the other laptops have. The Editor's Pick is an entirely subjective award, the decision for which is based on the reviewer's experience while testing the products. For this test, we withheld from announcing this award because there wasn't anything special in any of the laptops that didn't win Best Buy or Best Performer.

Home in a cube

Control your home with a just a tap. "Cube", a little box, acts as a controller for your smart house. Read more: <http://dgit.in/cubehome>

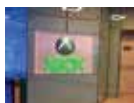


Helium atmosphere

Planets with helium rich atmosphere may outnumber planets with hydrogen rich atmosphere. Read more: <http://dgit.in/heatm>



Brand	Acer	Acer	HP	HP	Lenovo	ASUS
Model	Aspire E15 E5-571-593D	Aspire E15 E5-571G-341R	15-AF001AX	15-AC030TX	U41-70	X555LJ
Price (₹)	41700	39945	31990	39990	41490	38399
Warranty	1	1	1	1	1	1
Performance (of 30)	21.14	20.20	22.56	23.43	18.30	24.52
Features (of 20)	5.99	5.99	6.61	6.06	8.41	7.70
Build and Design (of 20)	7.32	6.93	9.09	8.35	7.77	7.36
Overall (of 100)	35.44	34.12	39.26	38.84	35.49	63.02
Features						
CPU	Intel Core i5-4210U	Intel Core i3-4005U	AMD A8-7410	Intel Core i3-5010U	Intel Core i3-5005U	Intel Core i3-5010U
RAM	8 GB	8 GB	4 GB	4 GB	4 GB	6 GB
Graphics	Intel HD graphics	NVIDIA GeForce 820M + Intel HD graphics	AMD Radeon R5	AMD Radeon R5 M330 + Intel HD Graphics 5500	Intel HD Graphics	NVIDIA 920M + Intel HD Graphics
HDD	1 TB	1 TB	1 TB	1 TB	1 TB	1 TB
Bundled OS	Windows 8.1	Windows 8.1	Windows 8.1	Windows 8.1	Windows 8.1	Windows 8.1
Screen Size (Inches)	15.6	15.6	15.6	15.6	14	15.6
Touch Screen? (Y/N)	No	No	No	No	No	No
Screen Resolution (Pixels) (1080p=2, 768p=1)	1366x768	1366x768	1366x768	1366x768	1920x1080	1366x768
Weight (kg)	2.5	2.5	2.1	2.3	1.7	2.3
No of USB 2.0	2	2	2	2	1	1
No of USB 3.0	1	1	1	1	2	2
Connectivity (LAN / Bluetooth / Wi-Fi)	Yes / Yes / Yes	Yes / Yes / Yes	Yes / Yes / Yes	Yes / Yes / Yes	Yes / Yes / Yes	Yes / Yes / Yes
DisplayPort / VGA (Y/Y)	No / Yes	No / Yes	No / No	No / No	No / No	No / Yes
HDMI out	Yes	Yes	Yes	Yes	Yes	Yes
Headphone/Mic/Combo	3.5 mm combo port	3.5 mm combo port	3.5 mm combo port	3.5 mm combo port	3.5 mm combo port	3.5 mm combo port
Wireless Keyboard & Mouse?	No	No	No	No	No	No
Memory Card Reader (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes
Fingerprint scanner?	No	No	No	No	No	No
Optical Drive (Y/N)	Yes	Yes	Yes	Yes	No	Yes
Inbuilt Webcam (Y/N)	Yes	Yes	Yes	Yes	Yes	Yes
Recovery Discs/Media	Yes	Yes	Yes	Yes	Yes	Yes
Docking port?	No	No	No	No	No	No
Benchmark scores						
PCMark 8 (Creative)	2465	2364	2635	3490	2935	3138
3D Mark (Ice Storm)	42667	44634	35069	36148	36555	53695
Sniper Elite V2 (fps)	6.5	10	10.7	10.4	5	11.3
Peacekeeper	3612	2187	1699	3049	1490	2997
WinRAR (KB/s)	3404	3315	2114	2906	2659	3236
Battery (minutes)	246 min	217 min	163 min	236 min	213 min	205 min
Screen brightness (cd/m2)	181.7	181.4	226.1	212.7	213.6	187.1
Contrast ratio	80.00	80.00	70.00	70.00	100.00	70.00
Temperature (max)	61 ~ 70 C	61 ~ 70 C	61 ~ 70 C	61 ~ 70 C	61 ~ 70 C	51 ~ 60 C
Build and Design						
Keyboard	7	7	7	7	8	6
Touchpad	7	7	6	6	8	8
Tablet mode?	No	No	No	No	No	No



Among the elite

Microsoft announces the Xbox One Elite Wireless Controller with elite features. Read more: <http://dgit.in/elitecntrlr>



Who needs sleep?

With the increasing number of drugs that help us to stay awake for longer, will the need to sleep be eliminated? Read more: <http://dgit.in/notosleep>

Budget laptops



Acer Aspire E15 E5-571-593D is a good overall budget laptop!

everyone in the competition only managed to pack in 4GB and 6GB of RAM, both the Acer Aspire E15 E5 571 and E15 E5 571G machines here came with a whopping 8GB of RAM built in – that's great for laptops selling at the 40k mark.

The two Acer laptops also have a well-arranged keyboard deck, with a dedicated number pad, and chiclet-keys that are nice to type on. However, using its single-slab touchpad isn't as great as the two HP laptops' who have the best touchpad experience across all the laptops we tested in this comparison. Both machines have almost the same screen brightness levels at 181 cd/m2 but their contrast ratios aren't anything to boast about, we're afraid. At 4 hours and 6 minutes, the Acer Aspire E5 571's battery performance is the best across all the budget laptops we tested this month, and with 3 hours 37 minutes the Aspire E5 571G does pretty well, too. However, battery performance only accounts for one-sixth of the total performance parameters in our test, and on most other fronts the Acer laptops don't do anything to make you sit up and take notice of their

prowess. Both 15-inch laptops are the most bulkiest off the bunch and carrying them anywhere is a chore. Multimedia experience on the Acer laptops is strictly okay. And the feature set on both the Acer Aspire laptops in this comparison are quite good, and all things considered they're great machines to consider if you're an Acer fan.

TWO HPS

Easily one of the most attractive laptops of the comparison, the two HP 15-AF001AX and HP 15 AC030TX have a textured screen lid with a dull silver finish which grabs eyeballs from a distance. And when you open them up, both laptops sport a glossy palmrest and surrounding keyboard deck with an attractive pattern like that of a plywood. Both machines are built well, just like the Acer laptops, but they're considerably lighter given their form factor, which makes them easier to carry around.

As far as features go, the HP 15-AF001AX is based on a quad-core AMD A8 APU, while the HP 15-AC030TX comes with an Intel Core i3 chip inside. Everything else

is exactly the same on both HP laptops, right from their external ports, weight, RAM, hard drive, even the presence of 2GB GDDR3 AMD Radeon R5 M330 graphics. However, the price disparity is quite big between the two machines – the AMD APU edition of the laptop is cheaper than its Intel counterpart by a whopping 8k!

While the Intel-equipped HP 15 laptop is overall the second best performer in this comparison, the AMD-powered HP 15 is close on its heel and ends up being third on the overall list, comfortably beating the two Acer and one Lenovo laptop in this test. Multitasking is much better on the two HP laptops, especially, when it comes to graphic-intensive work and you can even consider doing some lightweight gaming on them as well. The audio experience on the two HP laptops is also one of the better ones we experienced among all the laptops we reviewed for this comparison – even though laptop audio isn't great, overall, but the HP 15 laptops managed to perform better than most others.

As far as keyboard goes, there's nothing much to write home about, but the HP 15s

deserve special praise for its touchpad. These two laptops are the only ones in the comparison that come with a touchpad that has a dedicated left and mouse button – a fast disappearing trend. As a result, right or left clicking on the touchpad is the best experience we've had on a budget laptop in this test. Having said that, both these laptops don't have great screens when it comes to their contrast ratio which is the worst at 70:1 among all laptops we tested here. That's pretty much the only overwhelming negative in their case, apart from the HP 15-AC030TX's battery performance.

OF ASUS AND LENOVO

Where the ASUS offers great performance in a 15-inch form factor, the Lenovo is thin, slim, 14-inch budget ultraportable. Two very different laptops here with two very different use cases. Let's take a look at both of them separately.

The Lenovo U41-70 sports an attractive shell and is high on aesthetics, much like the two HP laptops we wrote about earlier. However, due to the Lenovo Y41's slim trim finish and anorexic dimensions – weighing



Acer Aspire E15 E5-571G-341R looks similar to the 571-593D



Coded emotions

Program your neurons and control how you feel with The Neural Lace. Read more: <http://dgit.in/neulace>



Feel your prosthetic leg

"Sensory enhanced" prosthetic leg can help you feel the ground beneath you. Read more: <http://dgit.in/prsthtcleg>



Pictured here is the HP 15 AF001AX, but the HP 15 AC030TX looks exactly similar to its Best Buy Award winning brethren. Both laptops dress themselves pretty well.

under 2 kg – the 14-inch laptop actually ends up being the best looking machine in our comparison test, at least to our eyes. It's not only good looking but is also well-built, despite being a budget laptop, and that says a lot – we wouldn't expect anything else from a Lenovo laptop anyways. Though it lacks a dedicated number pad as some other 15-inch laptops in this test, the Lenovo U41's keyboard sports curved keys that are great for typing, and for typing alone this laptop is simply the best among all laptops here.

The Lenovo U41 offers a decent feature set and a good collection of pre-installed software, too – no bloatware in there, all good stuff that you will find useful. While it barely does a good job in multitasking with day-to-day apps, the overall performance of the Lenovo U41-70 isn't greatest among all laptops tested for this comparison – in fact, it's the lowest. However, like we said, nothing's really wrong with it, and if you want a lightweight 14-inch budget laptop that's easily carried around, that can turn heads with its attractive-



The Lenovo U41-70 is a great laptop for ultraportable fans, as it's easy to take around due to its lightweight.

ness, look no further than the Lenovo U41-70.

The ASUS X555LJ is at the other end of the performance spectrum compared to the Lenovo U41. With NVIDIA GeForce 920M graphics and 6 gigs of RAM, and commendable battery life of 3 hours and 25 minutes in our battery benchmark test, the ASUS hands down beats all other laptops in this comparison when it comes to performance alone. Just take a look at the mag table and some of its benchmark

And like the HP and Lenovo laptops, the ASUS machine is also a looker, which is a pleasant surprise. Overall, a great machine, the ASUS one, at an attractive price.

WINNERS

No surprises for guessing the Best Performer Award here as it goes to the ASUS X555LJ, a deserving winner. As far as the Best Buy Award goes, the HP 15-AF001AX deserves it more than anyone else, as it does a great job of offering so



The ASUS X555LJ beats the rest of the competition easily to bag the Best Performer Award this month. A deserving winner!

scores – great to see them in a laptop available for under 40k. Gaming capability isn't great but not too bad either on this laptop. Watching movies is great as well, largely due to the SonicMaster audio built-in that helps provide better-than-average audio experience, compared to most other laptops at this price point. Its major drawback is its screen's contrast ratio which, like the HP laptops, isn't anything to boast about. However, despite packing in so much firepower, the ASUS laptop ran relatively cool with temps averaging in the mid-50 degrees at peak load, which is very good news indeed.

much at so little a cost. And the laptop is proof that AMD-powered machines, at least at the budget end of the market, are more than capable of taking on their Intel-powered counterparts. We would definitely like to see more OEMs sporting AMD machines for price-sensitive customers. No Editor's Pick? That's right. This reviewer tried very hard to decide between the two Acers, HP and Lenovo laptops, to see if anyone of them deserved a special mention. But due to lack of overwhelming unique features, we think there's very little to separate them, and so rest our case. **d**



Buns not guns

3D printed gun files are being kept a close eye on by some countries. Read more about the controversy here <http://digit.in/prntdguns>



Literally CHIMP

DARPA'S robot 'C.H.I.M.P.' turns out to be dumber than it looks. Read more: <http://digit.in/drparbt>

Smartbands



WEAR IT RIGHT

Smart wearable wristbands are exploding in the market all around us. We compare some of the top contenders vying for your wrist.

Prasid Banerjee
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You there. Yes you! The one who doesn't go outside and play and prefers to give voice commands to his phone rather than actually press the buttons. Traditionally we geeks are known to be a lazy lot, after all, why spend years of stored energy for something that a simple gesture can accomplish right? No, don't make a face now, you know you're one of us.

We're here to tell you that your way of life is being threat-

ened by what you love the most — tech. If there was ever a chance that we would go out an exercise, it is now, because of what tech companies are calling wearable technology. Yes, smartbands, fitness bands, smartwatches, GPS powered watches and more. While a lazy lot we might be, we also drool over the newest technology, and guess what, you can't really use a fitness band without working towards being fit. #Groan.

What's more, there's actually a market beyond us here. There are tech savvy fitness enthusiasts who see these gadgets pro-

viding good value. It does make sense in some ways, why spend 10k per year on the cheapest gym when you can buy a fitness band for 4k and do it yourself? They're not exactly perfect yet, but they're getting there very very quickly.

With companies like Samsung and Motorola focusing on smartwatches and so many more trying to capitalise on the health and fitness craze, this has become the most opportune time for a comparison like this. The market is just about to pick up, and things in this area are still at the initial stages. It's

like when smartphones were just starting out, you knew they were really cool, but you weren't sure if spending your money on them was worth it. While this trend may not pick up as easily, wearables will make sense in the future, the very near future.

THE COMPETITORS

Five smartbands were compared, with their prices ranging from ₹999 to ₹13,000. Namely, these are the Xiaomi Mi Band, Goqii Band, Timex IRONMAN Move X20, Fitgen Trek and the Huawei Talkband B2.



Batman, a vampire?

Justice League: Gods and monsters chronicles has been launched, with an all-new Vampire-Batman. Read more: <http://dgit.in/btmnvmp>



Story of a wave

QBism, a 'story' by Christopher Fuchs, solves quantum theory's deepest secrets. Read more: <http://dgit.in/qntmrly>

While most of you would already know about the Xiaomi Mi Band, the other names may not be as well known. That doesn't stop them from being real competitors in an otherwise immature market though. Together, these devices form the first generation of smartbands, and they've set the stage for future generations. They have their negatives and positives, and have defined what to do and what not to do with wearables.

XIAOMI MI BAND

Everyone's favourite inexpensive wearable device, the Xiaomi Mi Band is, in our opinion exactly what the market needs for wearable tech to really come into the mainstream. Its USP is that it costs only ₹999, making it the cheapest smartband out there. The Mi Band is the device you buy when you want to just try out a wearable gadget and



Xiaomi Mi Band

aren't yet sure if you want to shell out the big bucks on such a device. It can give you a very good idea of what more advanced wearables can do.

While the Xiaomi Mi Band can track your steps, that's about all it can do. There are some issues here and there as well, and the Mi Band app seems like a work in progress. The app crashed every time we tried to share progress on social media and some of the

features, like notifications, are just not available in the official app. We tried the tweaked apk on the MiUI forums, but that didn't work either.

The Mi Band is really light and unintrusive though, which means you'll more or less forget that you're wearing it through the day. It weighs only about 13 grams and is made out of good quality polycarbonate. So, like we said before, you buy this if you're just looking to try a

smartband, but not if you really plan on using it.

FITGEN TREK

The Fitgen Trek seemed like a very promising smartband when we first heard about it. The band has its own database of Indian foods, which earns a lot of points from us. This means you can input the food you eat into the app and it then measures your calorie intake. It makes up for one of the biggest weaknesses of the Mi Band, the fact that you couldn't do anything with the data that you got from that band. The Fitgen Trek can count the number of calories you've burned based on your steps, while putting it side by side with the number of calories you've consumed through your food data.

Unfortunately, the Trek's database isn't exactly effective. It asks for the user to input the exact amount of each food they've had, which is difficult

HOW WE TESTED

It's important to establish a few ground rules first. With the prices that companies are asking, should a fitness band be just that, or are additional features important? Of course it should be the latter, which means that a display, features like smart alarms, receiving calls or reading texts etc. are important for smartbands. Of course, you must also be able to use it as a watch, meaning it must show the time.

Next, it is also important for a smartband to have good battery life. You wouldn't want to charge such a device every day, especially considering that they're meant to be on your person all the time. The band can't track your data when it's charging, and if you want it to track sleep as well, then charging overnight also goes out the windows. Of course, you have to charge it after some time, but it has to be a reasonable amount of time. The Xiaomi Mi Band for example, lasts for over a month, which is ideal for a smartband. That said, the battery life deteriorates as you add features.

To actually compare the devices, we used them both separately and together. While using them together draws direct comparison between them, separately one can judge their individual merits and demerits. The performance of each smartband includes their performance individually and in comparison. We took into consideration the various features each offered, while testing the accuracy of their sensors by performing a variety of movements. The Timex IRONMAN Move X20 for example, tends to measure steps when in a slow moving vehicle.

Next comes the partner app, which none of these wearables can function without. The Xiaomi Mi Band works using the Mi Fit app, while the Huawei Talkband B2 works using the Huawei Wear app. The compatibility of these apps are usually on both Android and iOS, but some have also taken the jump to work on Windows as well. Apart from the compatibility, like any other app, these apps also have to be simple, intuitive and easy to use, gentler the learning curve, the better. In addition, if the

app is always running on the background and eating up resources, then that's a negative, since having a smartband doesn't necessarily mean you should also need a high end mobile phone. We judged the apps just like we do any other, while adding points for extra features which the app was responsible for adding, like smart alarms etc.

Finally, wearable tech has as much to do with technology as it does with fashion. Any smartband needs to look good and should be able to seamlessly be a part of your overall getup, just like watches are. Hence, the design of a smartband is important.

Not only the looks, the kind of material used to make the band is very important, too, as is the sturdiness of the device. Things like water resistance or water proofing can be important for something that will be on your person at all times. Like in smartphones, metal is also favourable here, but companies have to also ensure that the device is light enough to not be intrusive.



Need more emojis?

Unicode is adding 38 new emojis to the lineup of unicode 9.0. Read more: <http://dgit.in/msngemji>



A new hybrid dinosaur

Indominus rex, shown in Jurassic World, turn out to be a combination of various other species of dinosaurs. Read more: <http://dgit.in/indrex>

Smartbands

to do all the time. In addition, the database couldn't find very common foods. The real deal breaker for the Fitgen Trek for us though was something else. Every time you sync the band with the app, your phone loses its WiFi connection. Yes, you don't have to sync the band with the app often, but this started happening every time we would open the app to log data. In addition, the Fitgen Trek isn't exactly accurate either, being off by nearly 600 steps. At ₹5,999, that's a big misstep.

On the design front, the Trek is a very average looking device. It has a display, and a button that allows you to scroll through the display. This button takes a lot of force to press, and you'll end up not using it because of that. In addition, it isn't very comfortable. The plastic shell that holds the display is rigid, which comes in the way of the band taking the shape of your wrist. As a result, it wobbles around and feels uncomfortable.

The only good thing about the Fitgen Trek was that it runs for about seven days on a single charge of the battery. This of course is aided by the fact that we avoided syncing it with the app often, so as not to lose our Internet connections in the middle of downloading a game or streaming music.

TIMEX IRONMAN MOVE X20

That last problem in the Trek, about the plastic shell, is something that we faced with the Move X20 also. This smartband has a setup similar to that of the Trek, and it's even more uncomfortable, since it's bigger and heavier than the Trek. Also, like the Trek, the Move X20's display is accompanied by buttons for scrolling through information. There are two buttons here, one each on either side of the display.

As mentioned before, the Move X20 kept tracking daily commute on a bike as steps, which resulted in very inaccurate data. At the end of the day, the Move X20 showed that we've burned 3000 calories, which was more than four times of the actual number. No fitness enthusiast would ever appreciate a hurdle like this would they?

The Move X20 costs ₹8,999, and for the price, you would want a lot of additional features – the Move X20 can show texts and calls on the display, and that about covers all the additional features you get with this one. The app isn't very intuitive and in fact looks quite incomplete. There's no option to input food data, which means it can't track calorie intake. This makes the



Timex IRONMAN Move X20

data from the Move X20 pretty much useless.

It's a big green bulky looking device that doesn't quite fit the purpose of either the average fitness enthusiast or the wide eyed beginner. The Move X20 does have the best battery life out of the lot though, lasting for about 8 days at a stretch. You need to sync the Band to the app once a day at most, which is when you will need the Bluetooth to be on.

GOQII BAND

Of the five smartbands that have been used here, the Goqii Band without a doubt has the most unique approach to fitness gadgets. Goqii looks at the Band as a part of its ecosystem, which means you buy a subscription to all its services, which includes the Band. The Band here is the medium for data gathering, while Goqii also supplies you with a real life coach, who will be available for chats through its app and will even call you from time to time.

Now this human coach is what gives the Goqii Band its edge. The coach can help you in setting goals, while they also act as a food database. It's not about numbers here. While the Goqii Band can't show you calorie intake, the coach can themselves judge what you need to do based on the kind of meals you're eating every day.

The Band tracks your steps throughout the day and is pretty accurate at doing so, but it can't do much more than that. There is an alarm feature, which every other band, including the Mi Band also has. The Goqii Band can't take calls or show texts, neither does it support other apps. But as a fitness wearable, it does the job, at a starting price point of ₹3,999.

The Band weighs about 23 grams, similar to the Fitgen Trek, but unlike the Trek, the Goqii Band can wrap around your wrist just like a watch. It shows you the time, so you can replace your watch with this as well. It's not a bad looking smartband either. It is made of soft rubber, which feels nice on the wrist, with the only problem being that it started losing its colour pretty easily.

The Goqii app is also quite nice and easy to use. It allows you to log food, water and even



Fitgen Trek



An obedient car

With BMW 7 series, BMW and Baidu are planning to introduce their self driving car. Read more: <http://digit.in/bmwslfdrv>



The real virtual world

Palmer Luckey is making our virtual reality experience more 'real' with Oculus Touch. Read more: <http://digit.in/occrift>

7 WEARABLES TO CHECKOUT



Moto 360

The Moto 360 smartwatch is still amongst the best looking smartwatches available in India right now. It costs ₹12,999 currently, and is one of the few devices in India that run on Android Wear.

LG G Watch Urbane

The LG G Watch Urbane is arguably the best looking smartwatch available in India today, but it's pricy. The device costs ₹29,990, but if you want a smartwatch that resembles an actual watch, you can't get closer than this. Oh and it runs on Android Wear.



Asus Zenwatch 2

While Asus didn't bring the first Zenwatch to India, we expect its second iteration to make an appearance. Of course pricing and other details aren't known yet, but the Zenwatch 2 was showcased in Computex 2015 and looked quite nice.

Huawei Watch

The Huawei Talkband B2 will be brought to India alongside the Huawei Watch. Many say this is a Moto 360 look-alike, while others say it is the best looking smartwatch that you can buy today.



Fitbit Smartbands

When it comes to fitness wearables, you can't ignore the company that owns 85% of the global market. Fitbit doesn't have an official store in India, but the company is reportedly working on a deal with Amazon for setting up an online store.

Pebble Smartwatches

Pebble's smartwatches have been revered by many and is worth a try if you're spending on these devices. They look different, feel different and act different, and the company ships to India.



Yu Fit

At ₹999, the Yu Fit is amongst the most inexpensive smartbands available today. It is a direct competitor to the Xiaomi Mi Band and on paper, offers a number of extra features over that one. Micromax's Yu brand

announced this a month or so ago and it should start selling any time now.



Goqii Band

other exercise, which is then sent to your coach to analyse and give you advice on. It's the human angle of the Goqii Band that makes all the difference and makes up for almost all of its shortcomings. The company also organises treks etc. for its users to be involved in.

The Goqii Band's biggest weakness is perhaps its battery, which lasts between two and a half to three days with minimal syncing with the app. It uses Bluetooth to connect to the phone, but you only have to switch on the Bluetooth when syncing, since the Band has its own memory and can store data till it is synced. In general, you'll have to sync once a day.

HUAWEI TALKBAND B2

There are two things you must know about the Huawei Talkband B2 — first, that it isn't available in India yet, but will be in a few months, second, that it's the most expensive of the lot, with an expected price above ₹11,000. That said, the Talkband B2 is also the best

built and most premium smartband out there in the market today. The Talkband B2 has a leather strap, which is similar to traditional watch straps, and it clasps onto your wrist. You can adjust the size as well. The brown leather strap is complemented by the copper coloured metallic shell, which doubles up as a bluetooth headset. It's a really handy feature.

The display on top of the shell shows you the caller's name and you can simply unclasp it and use it as a bluetooth headset to receive calls. There's a button on the side that can be used to disconnect calls or turn on the display when needed.

The TalkBand B2's display is also quite nice and is driven by touch. When turned off, it's almost impossible to tell that the device actually has a display. You can swipe up or down to scroll through steps taken, calories burned or turn the run timer on when going for a jog. The closest any wearable, available in India, can get to this kind of premiumness is the Moto 360, which is a smartwatch.



Android with a blackberry
Blackberry planning to launch an android phone with a hardware keyboard. Read more: <http://digit.in/bbyandr>



Back in time
Taste Rewind, a feature by Spotify, can tell what songs you might have liked from a different decade. No kidding. Try it out.

Smartbands



	Xiaomi Mi Band	Timex IRONMAN Move X20	Fitgen Trek	Goqii Band	Huawei Talkband B2
Battery Life	30+ days	8 days	7 days	2.5-3 days	3 days
Material Used	Polycarbonate	Polycarbonate+Rubber	Polycarbonate+Rubber	Polycarbonate+Rubber	Metal+Leather
Connectivity	Bluetooth	Bluetooth	Bluetooth	Bluetooth	Bluetooth
Compatibility	Android and iOS	Android and iOS	Android and iOS	Android, iOS and Windows	Android and iOS
Price	₹999	₹8,999	₹5,999	₹3,999	₹11,000 approx
Final Score out of 100 after testing	71.65	60.36	61.04	72.3	78.5

The Huawei Wear app, which partners the Talkband B2 though, is a little too simpl. It shows you your sleep and steps and can be used to set alarms and event reminders, but there are no other features. It's a very good looking and easy to use app, the best amongst the five smartbands used here, but it seriously lacks features.

The battery on the Huawei Talkband B2 is also somewhat weak, lasting only about three to three and a half days at best.

BEST PERFORMER: Huawei Talkband B2

From the above, it should be pretty apparent that the Huawei Talkband B2 is the best performer out of all of these smartbands. As a basic fitness wearable, the Talkband counts your steps accurately and the bluetooth headset feature is often really useful. It also looks the best out of the five, with its premium build and looks. We've bumped it here and there often, but there are no major

scratches on the display or on the shell in general.

It's expensive, of course, but if a smartband is part of your get up, then this is the one you would want to buy, hands down.

BEST BUY: Goqii Band

Budget still matters though, which is why the Goqii Band's human coach is too hard to ignore. If you're a fitness enthusiast then this is the best do it yourself fitness gadget that you can buy right now. Yes, you won't be able to take calls or see texts using the band, but as a fitness wearable, the Goqii Band will be what you need. We would have loved it if it was waterproof, but water considering that none of the others provide that feature, water resistant works for now. This means it can power through a few splashes or light rain, but you wouldn't want to go swimming with this on.

WHAT YOU NEED TO KNOW ABOUT WEARABLES

Wearables as a category cover a lot of products, smartwatches and smartbands being amongst them. What we're comparing here are smartbands, which are predominantly related to fitness and health.

Smartbands can be like the Microsoft Smartband or Fitbit Surge, neither of which are available in India, but have a lot of specialised sensors for measuring your activities. Basic smartbands like the ones compared here are what are selling in India right now, and they don't have the luxury of such specialised sensors. Instead, companies try to use things like motion sensors to provide the best that they can. Some have innovative business models to fill the gap, while others rely on additional features.

If you're buying a smartband right now, then you're what one would call an early adopter, so even though a smartband may be good in comparison to others, you may find that it does not reach your expectations. In fact, this should be clear from this comparison as well.

The idea here is of course not to discourage you from buying one of these devices, but to inform you on exactly what your expectations should be. Wearables in general aren't perfect yet, be it a smartwatch or a smartband. The ideal scenario is these products functioning as standalone devices, instead of needing support from your phone. There's still a long way to go, but these little devices are maturing fast.



Huawei Talkband B2

Bazaar

THE LATEST PRODUCTS REVIEWED FOR YOU

The Digit Test Centre receives hundreds of products every month. Each of these products is put through a series of tests and is finally given a score. The final score is arrived at after considering a number of factors and evaluating them in terms of features, performance, value for money, build quality, and, in the case of software, even ease of use.

For better understanding of our ratings, here's a quick guide to our overall score

-  **Extremely poor product.**
Keep away!
-  **Strictly OK.**
Not recommended
-  **Decent product.**
Go for it, but there may be better products out there.
-  **Very good product.**
Highly recommended.
-  **Ground-breaking product.**
We've never seen anything like it before.
A definite must buy!

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XOLO
Chromebook



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LG Music Flow H7



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<http://dgit.in/corsairlogo>



Google+ dead?

Google+ profile links have vanished in thin air! Read more:
<http://dgit.in/1M6C199>

Bazaar

LG 55UF950T

Quality at a price

It's very difficult to recommend a television that costs ₹2,94,000, but if you're going to spend the money, this is quality indeed. The 55 inch LG UHD TV looks uber premium and can add to the looks of any media center. It's well built and there are four HDMI ports, accompanied by one USB 3.0 port and a couple of USB 2.0 ports. We wish there were more USB 3.0 ports though, since they are required to play 4K content from external media. In a TV that costs this much, it's not wrong to expect more such ports either, maybe even at the expense of a 2.0 port.

This TV may also be the first place where LG's WebOS platform can be successful. The remote on this TV functions very much like a PC mouse, and WebOS is arguably the smoothest TV interface available right now. There are dropdown menus that allow you to tinker with the TV settings or change the input source, while their built-in apps come in from the bottom on pressing the scroller on the remote. Of course, apps like Netflix, Deezer etc. don't work in India, but that's about the only downside to the OS. However, if you're interested in accessing US-only services, there's nothing that a good VPN can't let you do, so don't be disappointed completely on that front yet.

As mentioned before, the remote functions like a PC mouse. You will have to pair it with the TV at first, and then the cursor moves on the screen as you move the remote. It takes a little getting used to, but it isn't as steep a learning curve as you'd think. In addition, once you do get used to it, you wouldn't want your TV to function any other way. There's a wheel, which lets you scroll through the various menus on the TV, and it also makes scrolling that much simpler.

You will have to play around with the settings a little bit, in order to get the best picture quality out of this television, but with a contrast ratio of 650:1 at 50% brightness, the LG 55UF950T is really good. The upscaling engine does well with SD content, but you'll have to tinker the settings a little bit in order to get the best the TV can do. For PC and other similar input though, where we were sure of the quality of the source, we turned off all of the tweaks that the TV offered. Also, a very big advantage that this TV has over budget 4K televisions from Vu and Micromax is that it can play 4K content at 60Hz.



Price
₹2,34,900

Interactive
review

The upscaling engine on the LG UHD 4K TV though really kicks in when viewing Full HD content. In today's world, that is also the kind of content that is most readily available. The colours pop with really good blacks and whites and the television has no backlight bleeding issues, which speaks volumes about its panel quality.

That leaves us with the audio quality on this television. The LG 55UF950T has a built in 4.2 channel system, with 60W output. The TV offers six different audio modes, including Cricket, Game, Cinema, Standard, News and Music. There's also a surround option, which is more useful in slightly larger rooms. The TV is not extra loud, but it's loud enough that you won't need an external speaker system with it. For small to medium sized rooms, the TV alone should be enough. Of course, audiophiles will still want a good speaker system to ensure the best sound quality.

With all that said, there's really no denying that the LG UHD 4K TV is a good television. But then why don't we recommend buying it? Simply because most people can't afford to spend nearly ₹3 lakh on a television. Sure the price will be somewhat lower when you're buying from the store, but that still doesn't make it very affordable. So, like we said at the beginning of this review, if you have the budget, then knock yourself out, you won't regret it. But if this is the price of quality, then the Micromax 4K TV and similar versions from Vu are worth the compromise since they cost about 10% of this.

Prasid Banerjee



Features	80
Performance	81
Design	78
Value	40

Specifications

Screen: 55-inch, LED, IPS;
Resolution: 3840x2160, UHD; **3D:** Yes; **Smart TV:** Yes; **Remote:** Smart, Air remote; **OS:** WebOS 2.0; **DLNA:** Yes; **Weight:** 19 kg

Contact

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A new set of Windows

Microsoft is launching Windows 10 globally on the 29th of June. More here: <http://dgit.in/1AHYGaN>



Worth the dime?

SanDisk has unveiled a USB flash drive which is as small as a coin and has a capacity of 128GB: <http://dgit.in/1Q2ln00>

Goqii Band

Man and machine come together

Unlike most other smartbands in the market right now, Goqii is looking at its Band as a part of an entire ecosystem. On purchasing the band, you pay a minimum of ₹3,999, which gives you the Band and a real life Coach, who will talk to you through the Goqii app and call you to help you with setting your goals and going about your activities. This human coach makes up for a lot of the band's shortcomings.

For example, the Goqii Band lacks specialised sensors, depending on a sole motion sensor to detect your steps etc. You can input your food intake, which determines calorie intake, but there's no database of food products. This is one shortcoming that the coach fills in for, judging



Price
₹3,999

the calorie intake based on what you enter. The band also doesn't need to connect to the app all the time, which means you don't need to keep the bluetooth on and the app doesn't need to run in the background.

The major problems with the Goqii Band lies in the fact that its battery lasts for three days at best, depending on how often you sync with the band. It is also not waterproof, which a fitness tracker should always be, and the colour on the Goqii Band fades away very easily. Despite all its shortcomings, the real reason for recommending the GOQii Band is the human coach that you get. It's the tech equivalent of having a trainer and the human angle makes up for a lot of the product's shortcomings. For example, even if you don't get the time to log your meal, you can always tell your coach what you ate later and they can gauge your activities accordingly. For now this is a good first attempt by Goqii, but it needs to work a lot on its next iteration, which I'm sure the company's looking into.

Prasid Banerjee



Features	75
Performance.....	65
Value	65
Design.....	85

Specifications

Display: OLED, touchscreen;
Battery life: 7 days on a single charge; **Features:** Motion sensor, Vibrate, Humm mode, sweat proof and water resistant feature;
Monitor: Calories, sleep, number of steps walked, and more; **Warranty:** 1 year

Contact

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HTC One M9+

A veteran playing catch up



The overdose of metal on the HTC One M9+ allows for a really well built and sturdy smartphone, but in many ways, the M9+ is a veteran playing catch up. The Mediatek X10 Helio processor performs also most as well as the Exynos 7 Octa in the Galaxy S6, but coupled with the QHD display, it's really power intensive. The GPU performance is also quite weak.

Speaking of the display, in adding a QHD display, HTC lost what was arguably the most balanced display on smartphones. There's a pinkish hue on the display, which though visible from only some angles, is not something you'd expect from HTC. Another thing you wouldn't expect is the obvious design flaw in placing the narrow oval fingerprint sensor on the



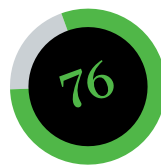
Price
₹45,458

phone. To work it properly, you need to tilt your finger and place it horizontally, so as to cover the entire sensor, which is not natural, and hence the sensor doesn't register your fingerprint sometimes.

The 20MP+2.1MP duo camera on the back is also pretty mediocre, especially when compared to the Samsung Galaxy S6. For a phone that costs over 50k, it's really not enough. The camera overexposes images in bright sunlight, while indoor images are also pretty average. It's a passable camera at best and not something a flagship should have.

If you're going to buy a flagship smartphone, then the HTC One M9+ is really not the one to buy. Except the build quality, there's no area where the One M9+ can beat its competitors and the Samsung Galaxy S6 is a better option.

Prasid Banerjee



Features	87
Performance.....	68
Design	84
Value	59

Specifications

Display: 5.2 inch QHD; **Processor:** 2.2 GHz MediaTek X10 Helio; **RAM:** 3GB; **Storage:** 32GB, expandable to 128GB; **Camera:** 20MP+2.1MP rear, 4MP ultrapixel front; **Battery:** 2840 mAh

Contact

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Website: www.htc.com



Typegram

This addictive web app turns Instagram's photos into creative typography:
<http://dgit.in/1ERHqux>



Poop alert!!!

Acer demonstrated a new gadget called the DiaperPie that detects the condition of a baby's diaper. Read more: <http://dgit.in/1ddE3Ik>

Bazaar

Xolo Chromebook

The Alternative

Build & Design

The Xolo Chromebook has a good plastic build and an understated design, one that makes use of flat, smooth surfaces and gently angled edges in conjunction. However, the keyboard is surrounded by a glossy transparent plastic panel which looks really cheap. The Xolo Chromebook's 11.6-inch matte display means that you aren't subjected to unnecessary glare and reflections. On the other hand, it has mediocre viewing angles.

Moving to the keyboard, it is solid and every chiclet key has sufficient travel. One issue is that some of the keys tend to slightly jam when they're not pressed on the centre. A bigger issue is that while the Chromebook keyboard is very similar to the Windows keyboard, there are some big differences as well. The most noticeable changes include no delete, caps lock or function keys, and while their functionality can be unlocked with the help of shortcuts, you'll need to learn a whole set of such new shortcuts.

The Xolo Chromebook is relatively heavy at 1.5 kgs but small enough to fit into most knapsacks or satchels.

Chrome OS: A new way to OS

As opposed to the many myths that surround Chrome OS, it isn't merely a browser masquerading as an OS. Yes, the Chrome browser is an integral part of the OS, but it's not the only part. For e.g. Chrome OS has its own file system (accessed with the help of the 'Files' app) and default video and music players (again apps). These apps may not have the features or capabilities of Windows software, but they do exist and they are 'offline' by every definition of the word. The Chrome App Store also has a number of quality apps that can work offline. You may not find the exact offline Windows app for the Chromebook, but chances are you'll be able to find a decent alternative.

Performance

In terms of day to day use, the Chromebook is a stickler to the term "budget performance". You can browse the Web with it but open a slightly heavy website (for instance pixlr.com) and you can immediately make out a dip in performance. One of the best things about the Chromebook is that unless you switch it off, it will remain in an "always on" state, which enables you to use it without any



Price
₹12,999



delays in terms up startup or booting time. Even if you shut down the Chromebook, it's back to a usable state in a matter of seconds.

In our battery test, the Xolo Chromebook was able to last for just over 7.5 hours while playing a full HD movie which means it will be able to just about last a day of regular use.

I know I shouldn't expect from a device that costs this little but when looked at as a primary machine, the Xolo Chromebook's performance falls short by a some distance.

Bottomline

For ₹12,999, there's a lot that the Chromebook does well, but there's also plenty of gaps that it should have ideally filled up.

If you're looking for a laptop to replace your primary Windows machine, look at budget Windows options like the HP Pavilion 14 or the Lenovo G50 instead. If you don't want to go for a large laptop then look at the Asus Eeebook X205ta.

If you want a really inexpensive machine for school or college and you only intend to use it to access Google's productivity tools and some light browsing, then a Chromebook would be ideal for you provided you have a reliable wireless connection but rather than the Xolo, I'd suggest you go for the slightly more expensive HP Chromebook 11.

Want a second machine to complement your main desktop or laptop? You can opt for the Xolo Chromebook if you're already invested in Google's ecosystem and use Chrome as your primary browser. If not, then just buy an iPad. It will be more comfortable to use around the house.

Nikhil Pradhan



Performance.....	56
Features	63
Design & Build	72
Value for Money	57

Specifications

Operating System: Chrome OS; **Screen Size:** 11.6-in at 1366x768 pixels; **Built-In Storage:** 16GB; **MicroSD Card Support:** Yes; **RAM:** 2GB; **Battery:** Li-Ion; **Processor:** 1.8GHz Rockchip RK3288 Quad-Core Cortex-A17

Contact

XOLO
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Website: www.xolo.in



Nintendroid?

Could Nintendo's upcoming system, codenamed NX be Android's OS?
<http://dgit.in/1GVbknE>



Spare the tan!

pHin is a device that will let you know if your swimming pool is ready to use or not:
<http://dgit.in/1G0YmnC>

Intel 750 PCIe SSD 1.2TB

Intel regains its lead among SSDs



Ever since the early days of SSDs when the X-25 ruled the roost followed by the 520 series, Intel's offerings have always been the one you'd go with when reliability mattered. And this reliability was a tradeoff against competitive pricing and now-a-days Intel's SKUs aren't the best performers. All that is now in the past thanks to the 750 series which is Intel's NVMe SSD for the consumer market.

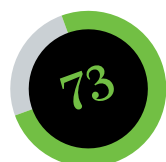
Price
₹98,000
(+Tax)

Intel makes no sacrifices when it comes to build quality.

The 750 PCIe SSD has a PCB that's way thicker than what the competition runs with. Even when it comes to heat dissipation, the 750 has a huge aluminium block that runs across the front of the PCB covering every single chip. The 750 makes use of quad die packages on the front while the rear only has single die chips. So the huge aluminium block is actually warranted. This arrangement of have quad die packages on the front allows Intel to up the capacity while sticking to the same form factor sans any daughter boards unlike the OCZ R4.

Performance-wise, the 750 blows everything out of the water, thanks to NVMe. The only competing device is the Samsung SM951. Kingston's HyperX predator though being an M.2 SSD does not make use of NVMe. With read speeds peaking at 2331 MB/s and write speeds capping out at 1339 MB/s, there is nothing in the market that even comes close to the Intel 750 PCIe SSD.

Mithun Mobandas



Performance.....90
 Build75
 Value for Money55

Specifications

SSDPEDMW012T4R5, Form factor: SFF-8639 PCIe
 Cost/GB: ₹66; Dimensions: 168x56x19 mm; Controller: Intel CH29AE41AB0
 Intel-Micron MLC NAND; Warranty: 5 years

Contact

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TP-Link Archer C2 AC750 Wireless Router

A worthy upgrade over the C20i

Six months back we'd tested the Archer C20i AC750 router which has the same hardware as this one but there quite a few improvements that caught our attention. The C2 and C20i both have the same MediaTek MT7620A processor so performance wise you won't notice any difference if you're on a wireless connection. If you were to face issues with the wireless signal then the C2 brings some amount of relief given the adjustable antennae that it sports. And the moment you switch to a wired setup, you'll immediately savour GbE speeds across all WAN ports thanks to Realtek's RTL8367RB switch. If you have the habit of transferring huge sized files



Price
₹3,489

across your home network then you will thank your stars for having gotten the C2 over the C20i.

We noticed that the newer antennae being supplied with the C2 is comparatively lighter than those that were supplied with earlier models like the WDR-4300. The difference makes it seem less premium but there is a silver lining in the form of metal threaded inserts. While the official documentation doesn't specify anything about the antenna gain, we've found out that the gain on each band might be different; i.e. 2 dBi for the 2.4 GHz band and 3 dBi for the 5 GHz band.

The glossy finish of the surface coupled with geometric undulating ridges makes gives the C2 quite the premium look and feel. One oversight that could have been easily taken care of was the absence of wall mounting holes on the bottom but you can make do with the ventilation slits. Since the price difference between the C2 and C20i is meagre, we don't see any reason to pick the latter.

Mithun Mobandas



Performance.....66
 Features62
 Build Quality62

Specifications

Wireless LAN Chip: MediaTek MT7620A+MT7610E; Memory: 64 MB; Protocols: 802.11 b/g/n/ac; Bandwidth: 750(433@5GHz+300@2.4GHz) Mbps; Ethernet: 4x LAN, 1x WAN, GbE Ports, Without modem; Warranty: 3 years.

Contact

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 Website: sales.in@tp-link.com



Robots know your pain

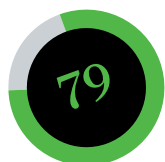
UC San Diego researchers have developed software that detects a person's levels of pain. Read more: <http://dgit.in/1Q8TSIr>



A good omen from HP

HP has launched the Omen, a high-end gaming laptop in India. Find out on it here: <http://dgit.in/1cz0mHK>

Bazaar



Benq W1070+

Feature rich, offers great value

Features 86
Performance 76
Build Quality 75
Value for Money 80

Specifications

Resolution: Full HD;
Native Aspect Ratio: 16:9;
Color Light Output: 2200 Lumens; **Connectivity:** RCA, Component, VGA, 2 x HDMI, RS232c, MHL (shared), Wireless HDMI;
Power: 353W; **3D:** Yes, Glasses not included;
Speakers: 10W; **Weight:** 2.5 kg; **Warranty:** 2 years

Contact

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Website: www.benq.co.in

The Benq W1070+ is a nice portable short-throw projector that weighs just 2.5 kg. It is encased in a white enamel shell that makes it appealing on the eye and the projector's plastic exterior feels well put together, right from its front stands to its heat dissipating grilles. Adjusting its lens for zoom, focus and tilt is intuitive and on-body menu controls are also easy to navigate, no problems whatsoever.

The projector has a bunch of features, including keystone adjustment, MHL (shared through HDMI), and Wireless HDMI – which is an optional feature, supported by a kit, basically allowing you to connect the projector to any source and beam fully uncompressed 1080p video wirelessly. Unfortunately, the projector we tested didn't come with this



Price
₹1,10,000

kit, neither did it come with 3D glasses to test its inbuilt 3D capability. However, 3D tests conducted on the W1070 (its older brethren) was pretty good. The projector comes with 10W speaker which is not earth-shattering, doing an average job of pumping out audio at best.

It performs a notch below the Epson EH-TW8200 which is twice as costly. Gaming, Full HD movie playback, stills, or text, the Benq W1070+ did a good overall job – but it's certainly not the best in terms of video performance. Apart from a slight hint of moire on full white, the projector suffered from no artefacts or distortions. It's quite bright and has a very good contrast ratio. The projector runs fairly cool at full load, peaking out at 64C, which is quite good.

Jayesh Shinde

ECS Z97 Machine

An optimal board for budget Z97 configurations

Often we tend to overlook the Z97 chipset when coming up with a configuration for gaming machines. The two factors that drive the decision to go in for a Z97 is that it supports SLI/Cross-fire and overclocking. Now the Z97 Machine isn't an enthusiast board but if you are relegated to pick between an H97 with a lot of features vs a stripped down Z97, it ends up giving you a good tradeoff between features. For example, gamers rarely bother with COM ports and Intel's Trusted Platform Modules which ECS have removed from this board to bring down manufacturing costs.

Being an ATX board, it has made a good use of all the board space available. The two PCIe x16 slots are spaced wide apart to allow plenty of airflow



Price
₹8,952

between the two cards. It even has an M.2 port that can accommodate 42, 60 and 80mm SSDs. Another aspect where this board shines is that it comes with a Realtek ALC1150 audio codec which you'd generally find in boards that sell for a lot more than what the ECS Z97 is priced at.

The Z97 Machine only has 4 SATA ports which should be more than sufficient for most gamers. Another thing we noticed was that the CPU mounting holes had a few exposed contact points on the rear. This will not be a problem with the stock Intel cooler which uses plastic tabs but aftermarket coolers with metal fittings might end up short-circuiting whatever has a PCB trace running across the mounting hole.

Mithun Mobandas



Features 60
Build 76

Specifications

Chipset: Intel Z97;
Memory support: 2x3000MHz upto 32GB;
LAN: Intel I218-V Gigabit Ethernet; **Audio:** ALC1150 7.1; **SATA:** 4x SATA III;
Expansion: 2x PCIe X16(x16+x16); **Dimensions (LxWxD):** 305 mm x 244 mm; **Warranty:** 3 years.

Contact

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Website: www.ecs.com.tw



Plasma tubes above you

An Australian Undergrad student recently confirmed that giant plasma tubes are floating in the sky above you. <http://dgit.in/1KOfFLO>



"Watson" in Civil War?

After benedict cumberbatch, It's Martin Freeman a.k.a. John Watson who has joined the Avengers cast now. <http://dgit.in/1cz0dEj>

BoAt Pint

Pint sized performance

Bluetooth speakers are just the right thing to have around you when you want to

listen to something, without plugging in your headphones. They're also great companions if you want to play music on the beach during your holiday. Enter the Boat Pint – yet another small Bluetooth speaker in this already packed segment. Let's take a look at just how good or bad the tiny wireless speaker really is.

The Boat Pint is a small cup sized Bluetooth speaker which can be easily held in one hand. It has a simple design with the driver facing the top protected by a plastic mesh. There is button ring integrated in the the speaker mesh which spots the play / pause and call receive button as well as the volume keys on either sides of the ring. The whole body has a rubberised feel which offers a decent



Price
₹2,990

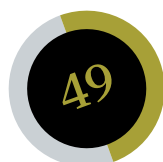
grip. At the lower bottom there is a microUSB charging port and a 3.5mm audio-in jack.

Catchy name aside, how does it perform?

We ran our standard cache of test tracks comprising different genres and found the highs and bass rather mediocre. The clarity too was average at best. Increase the volume above 70 percent and we could hear the sound cracking. To sum it up, while reasonably loud, the speaker's audio performance is just about average. The battery life is where perhaps the only area in which the Pint shines. The Boat Pint has better battery life than any other comparable speakers we have tested till date. The small speaker gave us about 15 hours of playback before giving out the 'battery low' cry.

At ₹2,990, we find ourselves hard pressed to recommend it, due to its various flaws. If you want an affordable Bluetooth speaker that performs as per its price and sounds better than the Pint on most occasions, we recommend you get the JBL Go.

Hardik Singh



Performance.....	50
Build	58
Features	59
Value	30

Specifications

Rated battery life: 10 Hr;
Features: Speakerphone with Mic;
Additional: Interactive prompts

Contact

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imaginemarketingindia.com
Website: <http://boat-lifestyle.com/>

Nikon COOLPIX S2900

Decent, cheap, but ultimately unnecessary

As with the Nikon S3700 before it, the COOLPIX

S2900 is a 20.2MP point-n-shoot camera that's cheap, light-weight and made of plastic. It's a handy, pocketable digital camera for budget-conscious customers. On paper, the COOLPIX S2900's sensor is the same as that of the S3700, the features are the same and you only seem to be losing out on 3x zoom (5x on the S2900 vs. 8x on the S3700) and VR for a price reduction of ₹1000.

The devil is in the details, however, and the difference between the cameras is more apparent when you compare their performance. The S2900, for whatever reason, displayed slightly more noise when cap-



Price
₹6,450

turing similar scenes under similar lighting conditions and with identical settings for ISO and zoom.

The colour accuracy and white balance remain the same as on the S3700, as does the sub-par video quality (720p @30fps), but we can't help but wonder why this camera even exists. It's just a worse, cheaper variant of the S3700 at a price difference that doesn't really matter except to those on the tightest possible budgets and even then, the S3700 can be had for the same price as the S2900 provided you know where to look (Amazon, Flipkart, etc.).

The problem with the S2900 is that in isolation, it's not a bad camera, especially at this price. It does a good job at the price. But, overshadowed by the S3700 as it is, we see absolutely no reason for recommending this camera over the latter when all you need to do is spend just a little bit more for a much better camera. So, definitely go for the S3700 over the S2900.

Anirudh Regidi



Performance.....	60
Features	65
Build	65
Value for money.....	65

Specifications

Sensor size: 1/2.3"; **Resolution:** 20.1MP; **Video recording:** 720p @30fps; **Optical zoom:** 8x l;
Shutter speed range: 1/2000 - 1s

Contact

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Website: www.nikon.co.in



"Silicon Valley selling you out"

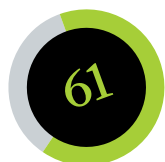
At a recent dinner event in Washington DC, Tim Cook takes a jab at Ad-driven companies including Google and Facebook. <http://dgit.in/1KFWmB6>



Dietbook for Hackers

"The Hacker's Diet" is a guide book to losing "weight and hair through stress and nutrition" for the hackers, by the hackers. <http://dgit.in/1eRcGoD>

Bazaar



ASUS P452L (2420)

For business on a budget

Features 60
Performance..... 74
Design 50
Value 60

Specifications

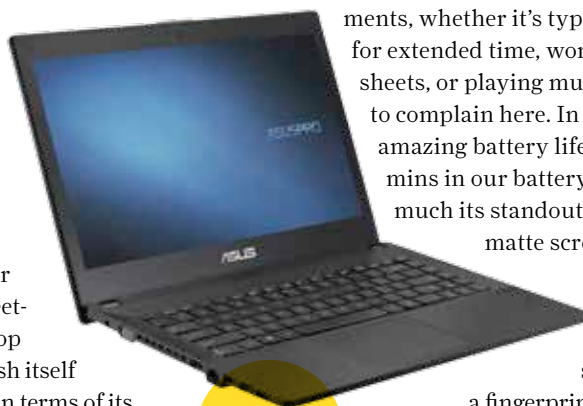
Screen: 14-inch, 1366x768;
CPU: 2GHz Intel Core i3-5005U; **RAM:** 4GB; **HDD:** 500GB, 5400 RPM; **GPU:** Intel HD 5500; **Webcam:** HD 720p; **Fingerprint sensor:** Yes; **Wireless:** Wi-Fi 802.11ac, Bluetooth 4.0; **Ports:** Ethernet, VGA, HDMI, USB (2.0 & 3.0), SD Card; **Weight:** 2.5 kg; **OS:** Windows 8.1 64-bit

Contact

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The ASUS P452L is a budget business notebook and it unashamedly dresses for the part it plays. Its shell is all-black with a matte finish and that may appear boring to common consumers, but for office use or boardroom meetings, black is chic. The laptop does very little to distinguish itself from most 14-inch laptops in terms of its build and design, as it's plain jane clamshell through and through. However, despite being 2.5 kg and feeling bulky, the laptop exudes confidence in its build quality, capable of surviving minor knocks and bumps on the desk.

On the inside, the machine sports budget components and nothing wrong with that given its price tag. The laptop performs well in all departments,



Price
₹39,999

whether it's typing on the keyboard for extended time, working on spreadsheets, or playing multimedia. Nothing to complain here. In fact, it has pretty amazing battery life clocking 4 hours 45 mins in our battery test, which is pretty much its standout feature – and its matte screen, too.

The ASUS P452L also comes with business-centric security features like a fingerprint sensor just below its keyboard. There are HDD and BIOS locking features built-in, too, for maximizing the security cover over the laptop's data.

To sum up, the ASUS P452L is just your average laptop with good features, performance, and a few business features thrown into the mix. It sells for an attractive price.

Jayesh Shinde

LG Music Flow H7

Empty Rooms

The LG Music Flow H7 is a wireless speaker that supports playback over Bluetooth, NFC pairing, wireless Google Cast streaming (over a Wi-Fi network), a wired network and a regular 3.5mm jack.

The H7 is also part of LG's new Music Flow multi-room audio series. What this means is that theoretically, you can place multiple Music Flow speakers (LG has launched the H7, H5 and H4 speakers in India) in different rooms in your house and you will be able to enjoy seamless audio playback off one/many sources.

The H7 is solid but for a speaker that costs above 50k to come to the party with an all plastic build is a big no-no.

On its own (with the price-tag a heavy cross to bear), the LG Music Flow H7 comes across as an average speaker that's not really

exceptional at playing any particular type of music. The best thing I can say about the H7's audio performance is that it's very loud and manages respectable clarity even when the volume is turned all the way up.

Playing music over the H7 using anything other than the tried and tested Bluetooth pairing method is rife with bugs and annoyances.

If you have money to spend and live in a house with more rooms than you know what to do with, then you should consider the Sonos Play:1 instead of the LG Music Flow H7. The Play:1 may be less powerful but it's also priced lower by ₹21,000,

sounds great, and is capable of fitting into a multi-room audio setup.

Nikhil Pradban



Price
₹52,990



Performance..... 68
Build & Design 78
Features 68
Value for money 40

Specifications

Drivers: 4; **RMS power output:** 70W; **Dock connector:** None; **Connect:** 802.11n Wi-Fi, Ethernet, optional Bluetooth; **Dimensions:** 370x110x232mm; **Weight:** 4.1kg

Contact

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Website: www.lg.com/in



Video Game High School

A web TV series about a high school where you "don't study physics but physics engine". take a look at <http://dgit.in/1M6Z5UA>



Space ain't all pretty

The EU's Philae Lander returned spooky images of comet 67P/Churyumov-Gerasimenko. See them here: <http://dgit.in/1FVtAva>

Nikon Coolpix S3700

When your phone camera isn't good enough



very apparent in the S3700 as well. Trying to snap a picture of a dog running in a field for example, is almost impossible because the focus speed is so slow and you can't zoom into an image too much because the small sensor means that not enough detail is captured.

Video recording was disappointing with support only for 720p@30fps and again, quality drops drastically when you start shooting in low light. Despite the lens-shift IS that's embedded in this camera, the handheld videos that we took were quite shaky and barely of any use.

In terms of white-balance and colour accuracy, we have no complaints. Images were sometimes a little bit overexposed, but overall, skin tones and colours were spot on and with none of the excessive post-processing that's apparent on a great many cheap p-n-s cameras and smartphones (we're looking at you, Samsung).

An ideal use-case for this camera, and all budget point-n-shoot cameras in general, is a scene where all the elements are in good lighting and nobody is moving around. In such a situation, this camera will give you very decent images. If you understand this much, you'll be satisfied with the S3700. Just don't expect miracles from it.

In terms of settings, there's really not much to set your pants on fire. You get the usual options to manually adjust white-balance, adjust ISO, etc., but all you really need are the assorted scene modes that should take care of most of your needs.

A nice bonus here is the addition of WiFi support, allowing you to instantly transfer your images and video to an Android or iOS device (via an app). This is really handy when you're travelling because it means that you're not worried about carrying a laptop or other similar device along to transfer images on the move, and you have the freedom to share the images instantly online if you so desire.

The best way to sum up this camera's performance would be to say that image quality will rival that of a Nexus 5, but something like an HTC M8 will soundly trounce it. That said, the Nexus 5 seems to offer faster focus and does offer much better video quality. This camera offers great value for money if you're on a budget and we'd heartily recommend it if so (Psst! You can find it online for much less than the stated MRP, further sweetening the deal.).

Anirudh Regidi

For those of us who're lucky enough to own a good smartphone, even the thought of purchasing a point-n-shoot camera wouldn't cross your mind. For everyone else, there're cameras like the Coolpix S3700. We were a bit sceptical of the S3700 at first, it seemed like a tiny, lightweight plastic toy, but the performance was surprisingly good for the price.

For someone who doesn't own a fancy camera, this 20MP camera with 8x optical zoom does remarkably well for itself provided you're shooting in good lighting (broad daylight) and don't use the zoom any more than you have to. The moment you try taking pictures in low light (twilight) the noise levels ramp up to atrocious levels, but you can't really expect more from a budget p-n-s camera. Aggravating this problem very slightly is the fact that the aperture is very small, further limiting low-light performance.

You do get decent image quality (but forget about cropping out more than about 25% of the image) and an assortment of scene modes that aren't half-bad if you don't like tweaking the settings of your camera (limited as they may be in this case).

The real problem with all p-n-s cameras is two-fold, the first that the sensor sizes are very small (though larger than that of your smartphone) and the second is that AF isn't very good and that's



Performance.....	65
Features	75
Build	65
Value for money.....	80

Specifications

Sensor size: 1/2.3";
Resolution: 20.2MP;
Video recording: 720p @30fps; **Optical zoom:** 8x
Shutter speed range: 1/2000 - 1s; **Features:** 4-Axis Hybrid VR, Lens-shift VR, Wi-Fi, multiple scene modes

Contact

Nikon India
Phone: 1800 102 7346
Email: goo.gl/GnrUpo
Website: www.nikon.co.in

We give you the skinny on Google Photos and the latest multimedia plugins to make you a pro in no time. Seriously.

File types and systems explained here; not only that, tips on accessing file types and systems across OSes

Android One low memory issues, budget gaming rigs and a tough decision between a PS4 and a gaming PC

Our readers never run out of tech issues and we couldn't be happier to help

Quick fix needed

Hello Big Brother, I'm Stevin and I'm writing to seek your help to reconstruct my PC. Here are my system specifications;

- Processor - Intel Pentium (D) CPU 3.0 GHz
- RAM - 1 GB
- Operating System - 32bit

This is my historic PC and it seems that my father will only help with repairing the existing machine and not about buying a new one. Please guide me to make some changes so that I can put together a better computer with your help.

—Stevin Martin

Hey Stevin Martin,

One thing that you should always mention when asking for help regarding a PC configuration is the budget that you have to work with. Otherwise, we can only work with estimates. Going by your configuration we're going to assume a budget somewhere between 15-20K. Since you mentioned that your dad's going to help with repairing it. We assume he talks of an upgrade so we've put together a configuration that you can go through in two stages. The first stage would be when you get a new motherboard, CPU and RAM. All of this can be accomplished in about 10K.

- Processor Intel G3240 `3800
- Motherboard ASUS H81M-CS ₹3400
- RAM DDR3 - 1333MHz 4 GB Hynix ₹1300
- HDD Existing
- Monitor Existing
- Keyboard Existing
- Mouse Existing

Your existing keyboard, mouse, monitor and hard drive would be enough to last you for quite a while. Since you haven't mentioned what kind of SMPS you have, we're assuming it happens to



Disable C6 and C7 states to avoid any issues with older power supplies

have a 24-pin ATX motherboard connector. The only problem is that the new Haswell Processors like the G3240 that we've suggested has new low power states (C6 and C7) which require power supplies to support the new power states. A work around is to disable C6 and C7 states in the BIOS. Or you can go about purchasing a new power supply as is suggested above. The power supply will be necessary if you are going in for the graphics card which we've put in the configuration as an add-on that can be left for later.

- Graphics Card AMD R7 240 ₹4190
- SMPS Corsair VS350 ₹1949

Do let us know if our assumptions what you wished to imply.

"Insufficient storage"

Hi Digit,
I am having the same problem which was referred by Mr. Himanshu Kumar in the letters section of June issue. I am also facing the error of insufficient storage while updating my apps from the Play Store.

I would like to know where the update file is downloaded in my phone because

my internal phone memory is getting filled up because of frequent updates.

Is there any code or way by which I can clear these files after having installed updates? And please don't tell to clear cache since this is what I've been doing to update my apps.

Here are my phone's specifications:

- Micromax Canvas A1
- OS: Android 5.1.1

—Ravikant Joshi

Hey Ravikant,

There are some phones which simply don't have the hardware to handle a lot of apps so you need to be a little careful with how many apps you are installing. You should have 400-500 MB of internal memory at any given time failing which the Android OS will start acting up. If you wish to continue with having a lot of apps on your phone then you might as well invest in a good memory card that gives a sufficient transfer speed. A Class 4 or Class 6 card seems to be the bare minimum. Then transfer apps to your SD card using one of the many apps that enable



Boost productivity

Become a better leader by making fewer decisions. Read more <http://dgit.in/leadrshp>



50 years of spacewalks

NASA celebrated by making a 30 minute documentary on its spacewalks called "Suit Up". Watch it here <http://dgit.in/nasadoc>

this. AppMgr III is one such app. If you find that even after all of these steps you're still facing issues then switching to CyanogenMod is another thing you can do to alleviate your problems.

Q PC or PS4?

Hello Digit,
My name is Aditya Khilari and I want to play some of the latest games that are coming out so what should I go in for? A PS4 or a gaming pc? Please enlighten me.

—Aditya Khilari



CyanogenMod is a lot leaner than stock Android

A Hey Aditya,

Picking between a PS4 and a Gaming machine comes down to how much you are willing to spend. A PS4 is quite expensive to begin with and each game costs a bomb too. So unless you are getting your PS4 for cheap the initial investment is quite high. Then getting a Playstation Plus subscription is a good way of getting games within a budget. However, the latest games don't end up on a Playstation Plus subscription for quite a while after launch so if you wish to buy those then each game is often priced at thrice of what the same game can be purchased for on the PC.

The PC on the other hand is very versatile when it comes to picking a gaming configuration. Moreover, you can get a lot more done with a PC than just gaming. Need we mention that PC gamers also end up getting the best deals amongst



An expensive gaming console

all major gaming platforms? The only place where you lose out are on exclusive titles. The scenario is quite different if you happen to be in a country where the consoles are sold for half the price as compared to India. Also, there are stores

which accept second-hand games and offer good deals on returns. So unless such a scenario develops in India the PC is the better option to go with.

Q Upgrade needed

Hello,
I am a student of class 10th. My old PC seems to be going bonkers all the time and stutters very often. It even crashes

every now and then. I use my

pc for programming, graphic design on Photoshop etc, using MS Office and most importantly, playing games. My PC needs to be on 24x7 for official and unofficial use. So I would like to upgrade my pc and/or build my own rig. Here are my current system's specifications (I know it's terrible but I could play some games on it):

- A Monitor from Dell Company
- Intel 2.4 Ghz Pentium 4 Processor
- 512 MB RAM
- 76 GB Hard Disk space
- NVIDIA GeForce 210 1024 MB graphics card
- A LG Super-Multi DVD Drive
- An ultra idiotic cabinet and an even worse motherboard which states "AMI-BIOS" on booting up.

Although I like the performance of my graphics card and my DVD drive, everything else is crap. I am always in need of space as my pc packs very, very less storage space. I am being allowed to buy 1 or 2 parts every month for this project. This is my very first build. So I would like you to kindly suggest an upgrade for my PC as I need to run many different types of applications and games on it. It should be near ₹23,000 and be able to do mid range gaming, run latest software (like the ones I get along with your awesome Digit magazine) and other good stuff. Thanks in advance.

P.S. - If there is a need for a new graphics card, please inform me about it so I may buy it if I get the chance. Please don't recommend any speakers as the ones I have work just fine. The same can be said about the monitor as well. Hoping for your reply at the earliest.

—Satyaraj Sharma

A Hey Satyaraj,

You're hoping for quite a lot in a limited budget. However, it's nothing we haven't been able to solve before. Programming and MS Office are very low resource consuming processes, especially the kind of programming you'll be doing as part of your coursework. Photoshop works well with mid-range configurations. So we were thinking of suggesting an i5 for your needs but your budget makes an i3 seem suitable. AMD's FX-6300 offers the same computing performance as the i3-4150 but lacks an IGP so the Intel processor seems to be more appropriate. Here's what we came up with.

- Processor Intel i3 4150 ₹7950
- Motherboard ASUS H81M-CS ₹3400
- RAM 2x 4GB DDR3 - 1600MHz ₹5146
- HDD 1 TB WD Blue ₹3650
- SMPS Corsair VS350 ₹1949



Gaming on a budget isn't always disheartening

Eight gigabytes of RAM should be appropriate for gaming and media editing. Also, the 1TB HDD will be more than sufficient given that you are coming from an 80 GB hard drive. For your first month's purchase, you will have to get the motherboard, CPU and the RAM if you wish to get the machine running. Hopefully, your existing power supply should be sufficient. If it's an old one then you might have to switch off C6 and C7 power states in the BIOS to run the PC without any issues. However, it would be better to wait it out a bit and put the entire thing together to avoid any hiccups. As for gaming, you can check out some of the games that have been tested and found to work without any discrete graphics card here – <http://dgit.in/IGP42004400>

GOOGLE PHOTOS

With Google Photos, it's evident that Google plans to bridge the gap between cloud storage, image hosting and image sharing services. Giving stiff competition to Flickr, Google Photos packs some of the most powerful features that have yet to be introduced in any other image hosting application. Though most of the features and services bundled with this application have been discussed about for a while, we'll move beyond basics and dig into some of the advanced features of this application.

Search for people, places and objects

It's Google, so the search is bound to be good. But, it's much better than what you'd imagine. If you're looking for all photos of your dog, a simple search for "dog" in the search bar will get what you want. You can search for color, people, animals, loca-



Advanced image search in Google Photos

tion or any other wild object that comes to your mind. Google Photos searches through your gallery using advanced image recognition techniques and search algorithms.

Note: The search term "car" not only returned images of



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Multimedia Plugins25

Tips & Tricks has its own page numbers, and does not follow the rest of the magazine's page numbers. This is done to ensure that you can cut out and save T&T in a separate folder for later reference.

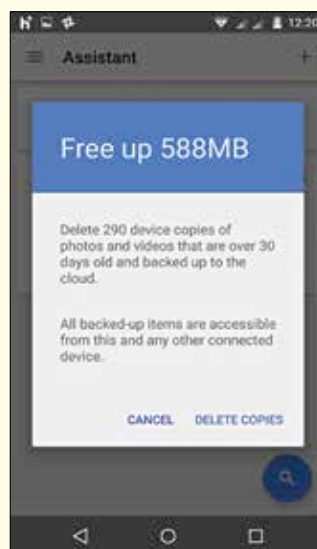
a car, but also of a car engine. Evidently, this application has a powerful AI backend.

Auto-delete local copies

If Google Photos can automatically upload media to the cloud then why can't it automatically delete media from your phone when it's done uploading or you're short of storage? Google Photos can be set to automatically remove images and videos from your smartphone once uploading is finished, hence eliminating identical and redundant copies of the image. But there's a catch: this feature can only be activated if you've set the app to back up "Full original resolution" images. If you've chosen to opt for unlimited storage, Google will compress these images and upload them to the server, hence the local and server copy of the same image won't be identical and Google will consider them as two different images.

The Google Photos app will also prompt you to delete images from your phone whenever you

run out of memory. This feature is helpful especially if you don't care about the resolution and quality of the image. The app



Assistant prompts to delete images in case of low memory

will keep a cached copy of the image in low resolution for quick viewing and save your phone memory.

Pinch to change view

You may assume that the only

function of the pinch-in and pinch-out feature is to zoom in and out of a picture, but there's more to it with Google Photos. By default, the app shows your images in a daily view, with thumbnails arranged chronologically, but there are a number of other options such as monthly view and comfortable view. You can move between the views simply by pinching in or out on your device's screen. You can even pinch in on an image in a view to open it in as an individual image. Regardless of the view, pinching out on a full-screen image will bring you back to the native image list. Swiping up or down on the full-screen image will have an identical effect.

Upload faster using the desktop client

It's preferable to use the desktop client if you are uploading a large number of photos to the cloud. Not only is it hassle-free, but also gives you a coherent upload speed. This option is also preferred if you wish to import images to your computer from a camera or SD card and want them to automatically get backed up to Google Photos when you connect your device

Select multiple photos

Imagine having to select 100 photos from your gallery and tapping on your screen a hundred times. Sounds tedious, right? Here's the hack: while viewing images in the Photos app, long-press on any photo to start selecting the photos. Then, without lifting your finger, drag upward, downward or sideways. This process will allow you to quickly select a series of photos without having to lift your finger. Holding down [Shift] works the same way in the browser client.



Undelete photos

Let's say you deleted the wrong photos while rapidly deleting a set of images using the aforementioned multi-select gestures. Or perhaps you changed your mind after hitting the delete icon. Don't worry, Google Photos has your back. It will hold on to those images for at least 60 days in the trash. All you have to do is navigate to the trash folder from the menu and rescue those images from the trash. If you're absolutely sure about deleting the pictures from the trash, just mark those you want to get rid of and select the delete icon again.

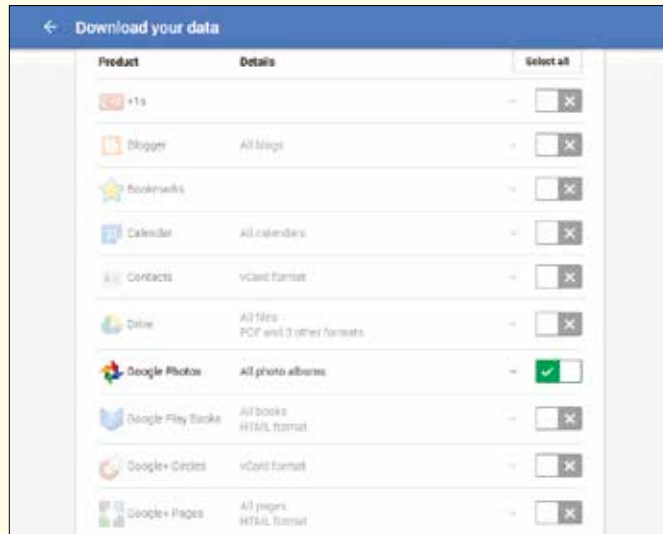


Retrieve images from the trash, which is located in the main menu



Quickly export photos

Unlike Dropbox, Google Photos' desktop uploader is a one-way client, and you can't directly download all your photos from it. If, however, you want to download all your media from the Google server, this can be achieved by using a very simple hack. All you have to do is use 'Google Takeout' (a data export project by Google). Log in to your account from a browser at <https://www.google.com/settings/takeout>.



Takeout is a handy tool to export your Google Photos data

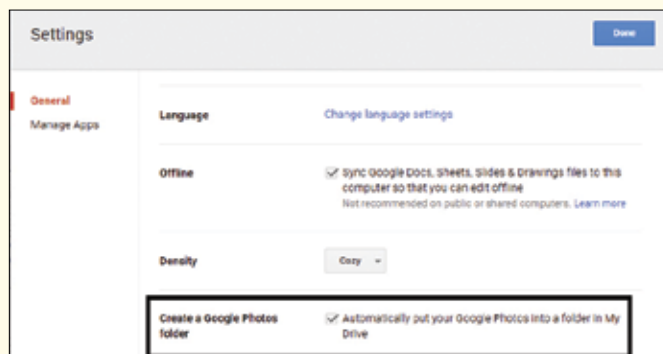
[google.com/settings/takeout](https://www.google.com/settings/takeout), select "Google Photos" and either select all your albums or the albums you'd like to download and you can download all your media without having to tediously select each individual image in the Google Photos gallery.



Make Google Drive and Photos work together

Intercloud compatibility is a major issue when it comes to different cloud applications. However, Google Photos and Google Drive function in perfect sync, and apparently Google Photos can even reside inside your Google Drive root folder and function just like a regular folder of Google Drive.

To enable this feature in Drive, navigate to Google Drive settings from a browser >



Saving Google Photos in Google Drive (Google Drive Settings)

Check "Automatically put your Google Photos into a folder in My Drive". And voila! Now all your photos and videos reside inside your Drive in a folder named "Google Photos" which can be accessed and synced across all platforms.



Send images/videos directly from Google Photos

By default, Google Photos isn't accessible from Gmail, however if you've linked your Photos to Google Drive as mentioned before, you can easily attach any of your Google Photos in email messages. Simply click the "Insert from Drive" option and then navigate to the Google Photos folder. You can similarly upload files to YouTube from the Google Photos folder in Drive by using the "Import from Google Photos" option.



Utilise unlimited storage

Ideally, Google Photos will give you unlimited storage space if you choose to upload at "High Quality", however there's a condition that these images will be compressed to 16MP resolution. In addition, always try to upload/sync your images from the Google Photos app or its desktop client. Using Google Drive to upload your images inside the "Drive\Google Photos" folder will eat into your 15GB Google storage.



Preserve your original work

If you're keen on preserving your original images in their native file format, resolution and size, you can save them in Google Photos. Additionally, you can save RAW and PSD extension files here, hence preserving the original details of your work. However, these types of file formats will have a storage cap, since they'll also be stored under Google Drive storage space.

MULTIMEDIA PLUG-INS

Every one of us uses at least one multimedia software every day. For some, it's a media player, while for others it's photo editors or video editors as a part of their day jobs. Since it's such a crucial part of our everyday computer usage, why not make the most of it? Keeping this in mind, we've curated a list of plug-ins for the most popular multimedia software to enhance your experience.

Adobe Photoshop



Convert pixel(s) into vector in a single click

'Pixel2Vector' is a handy Photoshop plug-in that converts any pixel into a vector. It's explicitly made for the purpose of saving your time creating a vector

image. You can convert everything including your paint brush or pencil designs, patterns and texts to vector images with a single click which can later be modified easily. After you've drawn an object and it's ready to be converted into vector art, select it and hit the Vector Shape button located in the Pixel2Vector panel.

Pixel2Vector supports Photoshop CS3+ (Action set), CS5, CS6, CC and CC-2014, and is available for free. Download it from <http://dgit.in/Pixel2Vector>

Create guides from your selection

'GuideGuide' is a neat plug-in that makes creating guides hassle-free in Photoshop. It lets you create guides based on your selection or size in pixels. The plug-in panel has a plethora of self-explanatory features. You can set the guides from the left, right, top or bottom margin and can also set the column and row count, width, and gutter. If you don't want to rely on the pixel system, use the selection tool and the quick guide buttons provided at the bottom.

Pixel2Vector supports Photoshop CS5, CS6 and CC, CC-2014, CC-2015 and is available for free. Download it from <http://dgit.in/GuideGuideDownload>

Google Sketchup Convert 3D models to 2D plane

Building a 3D model with Sketchup is not rocket science. However, converting it into an orthographic model (2D model) might be time-consuming. Enter 'Flattery', the Sketchup plug-in that takes on the painful job itself and lets you create 2D models from 3D with just a few clicks.

Flattery, as the name may suggest considers your 3D model as a box and unfolds it.

The tool accompanied by the plug-in needs to be used on each face of the 3D object. It unfolds each face as you select it with the tool. To convert the entire object, you must repeat the process for every face. Although time-consuming, it's still simpler than redrawing.

Google Sketchup and Sketchup support Flattery, which is available for free. Download it from <http://dgit.in/FlatteryDownload>

Push/Pull multiple curved surfaces

Sketchup is based entirely on Push/Pull architecture. All models within it are generated by extruding the surface. It works flawlessly on plain surfaces, however it doesn't work as well on curved surfaces. To work on such surfaces, you can use the 'Joint Push Pull' plug-in. Single and multiple curved surfaces can be extruded with it.

Joint Push Pull is supported by Google Sketchup and Sketchup, and is available for free. Download it from <http://dgit.in/JointPushPull>

Create high-quality photo-realistic renders

High-quality rendering isn't possible with Sketchup. For this, you have to rely on third-party rendering programs. While



Check if the plugin is active

there are a glut of programs that will offer you this functionality, very few among them are available for free.

Kerkythea is a light-weight rendering system that supports Sketchup. To render your Sketchup model, firstly set the angle you want. In the menu bar, navigate to plug-ins > Kerkythea Exporter > OK > Save the XML file. In Kerkythea, open the saved XML file and hit the render button located at the top. You can also modify color, camera, and textures as per your requirements.

Kerkythea is available for free. Download Kerkythea and the Sketchup plug-in from <http://dgit.in/Kerkythea>

Adobe Illustrator Generate vector QR code in a single click

Generating a QR code in vector-based format in Illustrator is made easy with this script. Once installed, open it from File > Scripts > QR > Enter the text information > QR size > OK. That's it! You'll get an

editable vector QR. It's available for free at <http://dgit.in/VectorQR>

Export each layer as a document

Extracting content from a single layer in Illustrator might be difficult. However, this can be simplified using the 'Layer Exporter' script. It automatically exports data from each layer to a PNG or PDF file. Once the script has been installed, you can find it under File > Scripts > Other Scripts. The exported file is saved in the same folder as your original file.

Download Layer Export from <http://dgit.in/LayerExport>

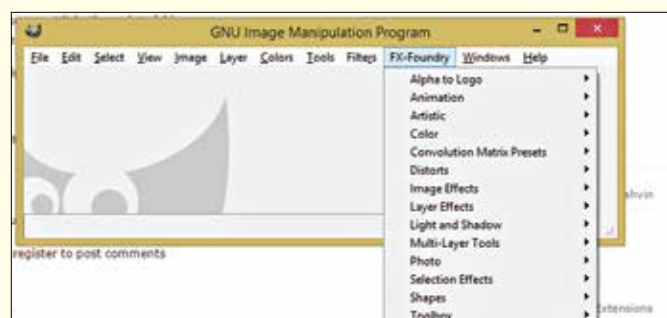
Adobe After Effects Animate objects (with inverse-kinematics)

Animating a character requires intensive rigging and inverse kinematics (IK) to make it more realistic. However, After Effects doesn't offer this functionality natively, thus producing unrealistic character animation. This functionality can be added to After Effects by the 'DuIK' plug-in. It allows you to create complex rigs that simulate muscles, bones and IK.

Download DuIK from <http://dgit.in/DuIKDownload>

Adobe Indesign Quickly create e-books and apps

For the author inside you, there's a way to create a complete digital publishing suite without needing to know about any of the technology involved. 'Aquadadas AVE' is a free add-on that lets you create customised e-books and apps, which include videos, sliders, audio, interactive buttons and more. While it's free for these basic features, premium features have a fee. Download it from <https://bitly.com/a/bitlinks/1IYKnPe>



Various FX Foundry tools



Create vector barcode from ISBN number

Instead of relying on third-party software to create barcodes, you can have the functionality built right into InDesign. Called 'BookBarCode', this script allows you to create vector barcodes from ISBN numbers. After installing the script, use the Rectangular Frame Tool to create a barcode zone. Then, run the BookBarCode script from the 'Scripts' panel. Enter your ISBN number and customise the barcode according to your needs. The shareware version of BookBarCode can be downloaded from <http://dgit.in/BookBarCodeTrial>

Bukkit



Add objects to Minecraft

'Bukkit', the open source software to extend Minecraft Multiplayer Server, has a plug-in called 'CraftBook' that enables you to include additional mechanics to Minecraft. By editing the config file, you can enable any item you want to use – be it Redstone ICs, elevators, cauldrons for cooking, custom crafting recipes, toggleable areas and switches or chairs, among other mods. The plug-in file and details on the installation process can be found at <http://dgit.in/CraftBookplug-in>



Prevent problems in Minecraft Server

'GriefPrevention' is a ready-to-use plug-in that will prevent build/break, theft, spam, fire, spawn camping and lava in Minecraft. All you have to do is install the plug-in without the hassle of managing a database. The plug-in file and installation process can be found at <http://dgit.in/grprvt>

Blender



Import images as planes

If you're a Blender user, you'll

know how painful it is to add textures to the planes. Unless the texture has exact 1:1 ratio, the image won't place itself perfectly on the plane and have to resize the plane to match the image. 'Image as Planes' will not only cut down on the task of resizing the plane, but also allow you to add image planes of any size. Get it from <http://dgit.in/ImageAsPlanes>

Once you've installed the plug-in, go to Add Menu > Image as Planes > Select the image.



Save your cache for viewing offline



Automatically render tile size

Tile size is the portion of the image rendered at a time. The larger the tile size, the lesser is the time required for rendering, but greater is the CPU usage. However, it's always recommended to use smaller sizes since doing this allows the CPU to focus on a smaller portion of the scene, eventually saving memory and reducing crashes.

To do this, however, you must always keep a look at the tile size when changing the rendering mode. The 'Auto Render Tile Size' plug-in automatically selects the tile size depending on CPU, GPU or border rendering and can be downloaded for free from <http://dgit.in/AutoTileSize>

Google Earth



Use Google Earth while offline

'Cache for Google Earth' is not

exactly an add-on, but a tool that allows Google Earth to work offline by saving the cache contents while they're in a predictable state. With this, you can fully use Google Earth's cached data when not connected to the internet. A free trial of the \$19 tool is available for download at <http://dgit.in/cachege>

Gimp



Enhance stock image processing

GIMP's stock image processing can be enhanced by 'FX Foundry' – the plug-in that adds more than 100 separate image processing scripts. Ranging from Alpha to Logo and Animation, it contains all the necessary scripts you'll need. Download FX Foundry from <http://dgit.in/FXFoundry>



Create quick focused animations

Abbreviated as 'GAP', 'GIMP Animation Package' adds animation functionality to the native image editor. Not as powerful as other full-fledged animation programs, it works well for focusing and defocusing animations. Download GAP from <http://dgit.in/gapgp>



Make use of GIMP Paint Studio

The GIMP toolset might be limited in number and functionality, but you can enhance it with the 'GIMP Paint Studio' (GPS), a plug-in that offers more brushes, gradients, patterns, and tool presets, among other things. Download GPS from <http://dgit.in/GIMPPaintStudio>



Create multiple bookmarks and jump to them

If you love to rewatch some of your favourite scenes from your favourite movie repeatedly,

you'll have to memorise their timestamps. The 'Moments Tracker' plug-in saves you this hassle by creating multiple bookmarks or timestamps for a particular media file and allowing you to jump to any of them. Download it from <http://dgit.in/MomentsTracker>



Automatically remove duplicate files from your playlist

Cleaning your playlist of duplicate media files could be a chore, especially if it contains too many media files. You'll need to invest considerable time better spent elsewhere, cleaning it. To avoid this, use the 'Playlist Cleaner' plug-in which automatically removes duplicates and deletes files that have been removed from the source. To clean your playlist, go to Playlist > View > Playlist Cleaner > Check "Delete Duplicates", "Delete Orphans" > OK. Download Playlist Cleaner from <http://dgit.in/PlaylistCleaner>



Play a single media file on multiple PCs simultaneously

'Syncplay' is an interesting plug-in that lets you play a single media file on multiple PCs simultaneously. To set it up, you need VLC and the Syncplay plug-in installed on every computer which are connected to the same server. Then, you'll set up the VLC executable file, username and media file location in the configuration window. Once this is done, you'll be able to see the same file playing on every PC connected which can be moved forward, backward, paused or played from any of these devices which will be reflected on every PC.

Download Syncplay from <http://dgit.in/Syncplay>



Robot hurdler

The MIT Cheetah, which previously broke speed records, is now an expert hurdler too. Read more: <http://dgit.in/hrdlrbot>



Galaxy Map

Find out how NASA is mapping our Milky Way Galaxy, from the inside out! <http://dgit.in/glxymap>

Workshop

Become a File Ninja

No longer will you be bewildered when you encounter an exotic file type. Or be left befuddled when your Mac drive won't open on your laptop running Windows. This is your ultimate guide to becoming a file ninja

Purusharth Sharma
readersletters@digit.in

In an ideal world, which might probably exist in some parallel universe, there would only be one operating system with one universal file type. People in this utopian world would exchange software and other files on pen drives and hard disks without the slightest consideration for OS and file system compatibility issues. Also, in that world, printers would work perfectly and people would eat "Breakfast food" all day.

Unfortunately, we live in a less than perfect world, where we have a number of different operating systems, file systems and file types. And more often than not, we'll encounter some problem related to incompatibility. So, what do you do when you encounter a Mac formatted pen drive on your Windows PC or a file type you have no idea how to open? Don't worry, we've got you covered. Read on, and hopefully by the end of this article you'll have become a file ninja, with your own arsenal of tools to slay any file related problem you may encounter.

Open various file types on different operating systems

There was a time in a not so recent past when Windows was the most popular operating system in the consumer market. Linux was used mainly by geeks, while Apple was restricted mainly to the "Apple fan boy club". However, all this has



Fuse can open ext partitions on OS X

changed in the past decade. Macbooks have become a lot more affordable and commonplace. The Linux community, meanwhile, has been working hard to make the OS more user friendly, and a number of distros including Ubuntu are making their mark in the mainstream market. Though this provides the user with a number of options to choose from, it also greases the wheels for incompatibility issues that the users end up facing – especially when it comes to the file systems being used by each OS.

Windows, OS X and Linux use completely different file systems. Windows has been using NTFS (New Technology File Systems), since the days of NT, while Linux has been using the ext standard for a long time with ext4 being the norm these days, and OS X uses HFS (Hierar-

chical File System) with HFS+ being its latest iteration. Each file system is incompatible with operating systems they're not meant for. There's another common file type which, even though outdated, is still commonly used. It's called "FAT32". Mostly used on external storage devices, it's one of those rare file systems supported by most devices (including Xbox, Playstation and the latest Full-HD LED TV you just bought) and operating systems in the market.

In the following paragraphs, we'll introduce you to a number of tools and tricks of the trade to access different file systems on all the platforms.

NTFS (Windows)

Windows' preferred file format, NTFS, has been part of its family since the first



Watch those moles

Use this medical grade smartphone accessory to detect skin cancer in the comfort of your own home
<http://dgit.in/watchml>



The modern woman

New discoveries show that women in the bronze age were actually very cosmopolitan.
<http://dgit.in/mdrnwmn>

version of NT came out in the year 1993 and has since been used by all successors.

Most common Linux distributions, including Ubuntu and Fedora, have in-built support for the NTFS partitions and can, both read and write to it without any hassle. All you have to do is mount the NTFS partitions the way you'd mount any other partition and you're done. The problem arises when you try using the NTFS partition with OS X. By default, you can read NTFS partition in OS X but you can't write into an NTFS partition. If you want to write into an NTFS partition, use one of the following methods:

1. **Paid software:** There are a number of paid software available in the market that make it quite easy to read and write to NTFS partitions in OS X. The most commonly used paid software is 'Paragon'. The software costs around \$20 (₹1,271), and after installation you can mount NTFS partitions just like you'd mount a native partition.
2. **The terminal:** Another way to mount the partition and read and write to it is by using the terminal. Open the terminal and follow these steps:
 - Enter `sudo nano /etc/fstab` followed by your password.
 - A new program called 'nano' will pop up that doesn't look much different than the terminal. Enter `LABEL=drivename none ntfs rw, auto, nobrowse` where you need to replace "drivename" with the name of the drive.
 - Press [Ctrl] + [O] to save the changes and [Ctrl] + [X] to exit the program.
 - Unmount and unplug the drive.
 - Once you plug it back in, you won't see the drive pop up in the finder anymore. To see the drive, select 'go to folder' in the finder's menubar > Enter / volumes > Press [Enter].
 - Once inside the hidden Volumes folder, you'll see your drive mounted and ready to be accessed. You can also pin the drive to favourites for easy access.
3. **NTFS3G and FUSE:** Another technique that lets you read and write NTFS drives uses these two software. Download and install 'OSXFUSE' and

'NTFS-3G'. Both these software install the necessary drivers to read and write NTFS drives on your Mac. But you may face a slight problem. Once you restart your computer, you'll be bombarded with a number of errors because NTFS-3G won't be able to read your other HFS+ drives. To make these errors go away, all you need to do is download a nifty little software called 'fuse-wait' and you're all done.

HFS+ (OS X)

HFS and HFS+ are the file systems preferred by Mac OS X, and they aren't compatible with Linux and Windows. So what do you do when you have a HFS+ formatted pen drive that isn't opening on your Linux/Windows computer? Don't worry, we'll tell you what to do.

Linux, by default, supports HFS and HFS+ file systems in read only mode only. However, there's a way to change that too. (using 'HFSplus')

To do it, follow these steps:

- Open the terminal and enter `sudo apt-get install hfsprogs`
- Once the installation is done, remount the drive.
- Type in `sudo mount -t hfsplus -o remount,force,rw /mount/point` and voila, you're done! Now you should be able to both, read and write to the file in Linux.

Ext2, 3 and 4 (Linux)

Linux uses Ext partitions, with Ext4 being the latest iteration. Neither Mac nor Windows can natively read and write to Ext partitions, however, there are a number of third-party software available that let you do this. In Windows, you can access ext partitions by downloading and installing 'Ext2fsd', which is basically a file system driver that provides you with read only access to the HFS+ partition. Though you can enable write support for ext2 and ext3 partitions, we recommend against it since



Paragon lets you open HFS+ drive in Windows

While Linux can at least read the format, Windows can't even do that. There are a number of software in the market, both free and paid, that let you access the HFS drive.

One such free software that lets you access HFS+ partitions in Windows is 'HFSExplorer'. It lets you read and copy the contents from the partition, but sadly won't let you write to it. 'Paragon' and 'MacDrive' are paid alternatives that let you do both tasks.

To write to a HFS+ drive in Linux, you must install a program called 'hfsprogs'.

you risk your data getting corrupted. Another popular alternative is the 'DiskInternals Linux Reader' that comes with its own in-built file explorer and lets you read the ext partition. There's unfortunately no free and stable way to write to ext partitions. But look online and you'll find hacks that may or may not work. The best bet, if you really want to write to an ext partition, is 'Paragon ExtFS' that retails for around \$20 (₹1,271).

There are two ways to open it in OS X. The first way being buying a paid soft-



Status update

Struggling with your Facebook status? Why not ask Facebook for one? Read more: <http://dgit.in/statusupdt>



PS4 to space

Kerbal space program, with its construction and space flight simulation, is now coming to the PlayStation 4. Read more: <http://dgit.in/kspps4>

Workshop

were like Paragon ExtFS. Another way you can do the same thing requires a bit of patience, but it will save your hard earned money. Download 'OSXFuse'. While installing, make sure that you install the 'MacFUSE compatibility layer' too. Once you restart your Mac, you'll be able to read the ext partition.

By default, the write privileges are turned off due to stability issues. However, if you want to write data to the ext partition, at the risk of probably corrupting it, you can turn it on by downloading and installing a package called 'FUSE-EXT2'. Once done, restart your machine and enter the following command in the terminal:

```
sudo sed -e 's/
OPTIONS="auto_xattr,defer_
permissions"/OPTIONS="auto_
xattr,defer_permissions,rw+/'
-i .orig /System/Library/
Filesystems/fuse-ext2.fs/fuse-
ext2.util
```

You should now be able to write to the partition.

Open various file types across different platforms

There are thousands of file types in existence, some platform independent and some not. So how do you ensure that the file you're sending to your friend running some other OS will work on his/her system? Don't worry, we'll help you out.

Open document files

Document files depend on the software and not the operating system you use, so you don't have to worry about inter-OS compatibility. But what do you do if you don't have the software that your friend used to create the document file? There are a number of software available in the market that will help you with this. Most people use Microsoft Office for all their document needs, however if you don't have it and don't want to spend your hard earned money on it, you can use any of the free and open source software in the market. The most popular software in this category is 'LibreOffice' which can open all files created by MS Office.

Another option is to do all your document-related work on a cloud-based platform such as Google Docs. In this way,

you won't be restricted by your OS and wouldn't have to worry about downloading a particular software either. All you'd need is a decent internet connection and a web browser.

Open video or audio files

Audio and video files don't depend on the operating system either, but rather

enough computing power to run a complete operating system inside another one. Not only this, with enough computing power, you can run a virtual machine loaded with Linux inside another virtual machine running OS X which itself is running inside a Windows machine (Inception much?). There are a number of



VMware running Windows inside OSX

on the codecs that are installed on your machine. You can do one of two things – either install the codec manually or install the ultimate solution, 'VLC media player'. Available for all platforms, the software supports almost all audio and video codes.

Open applications

Say, there's an application available only on Windows that you want to use on your Macbook or vice versa. What do you do then? There are a number of ways to run this application, with the most common being dual-booting your machine so that you have both the OSes running at the same time. However, dual booting is a tedious job – it requires you to partition your hard disk, install the operating systems separately, change the bios settings and much more. Don't worry. There are a number of other easier ways to open applications as well.

1. Use a virtualisation software:

Nowadays our computers come with

software in the market to enable you to run a different OS inside your current operating system with the most popular ones being VirtualBox (free) and VMware (paid). Install any of them and get a copy of the OS you want to use. You'll have it up and running in no time. You can do almost everything on these virtual machines that you can otherwise do on the OSes natively, including installing and running applications.

2. **Use software like WINE and CYGWIN without having to run a virtual machine directly:** To run a virtual machine, you need to have a copy of Windows. Don't worry if you don't want to spend thousands of rupees to just run a virtual machine. You can install WINE on your Linux or OS X machine and it will let you run a number of Windows software without the hassle of creating a virtual machine. WINE doesn't create a virtual machine and is aptly called "Wine Is



Walk like a boss

Among the infant robots that fail to even stand, SRI's robot 'DURUS' successfully walked for 2.5 kms in just two and a half hours. Read more: <http://dgit.in/robowalk>



Smart cars

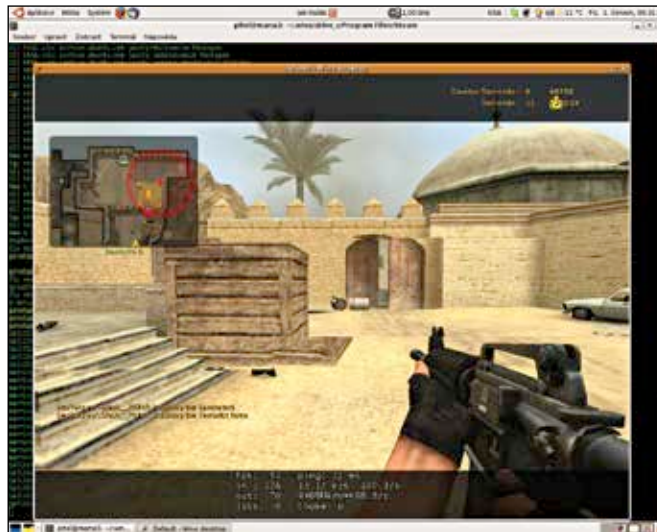
Imagine a car that detects potholes and warns you beforehand. Now see it come to life. Read more: <http://dgit.in/smartcars>

Not an Emulator". Another popular alternative for Mac users is the paid software called 'CrossOver Mac'. The software uses WINE's open source code and adds a GUI interface to it. It also officially supports a number of Windows-only software, hence you wouldn't have to worry about stability issues. Similarly you can install 'Cygwin' on your Windows machine, which will provide you with a Unix-environment.

3. **Use software to extract data out of executables:** If you don't actually want to run the file but just take a look at the multimedia and other files it contains, you don't need to run a virtual machine or anything, all you have to do is use a software like File Juicer which extracts all the data it can get (including images, audio, video etc) from the application file.

Obscure file types

- **.eml:** Chances are you might encounter this filetype in some email. .eml files are basically archived email files created by Microsoft outlook or outlook express. There are a number of ways to open it. The simplest one being changing the file extension to .mht. .EML files are similar to .MHTML files and can easily be opened by any browser. Though the email might not be formatted correctly and you won't be able to access the attachments, but you'll still be able to see the text quickly. If you want access the email along with the attachment and in a proper formatted fashion, open it using outlook. And if you don't have outlook, then you can also download and install " free EML file



Playing Counter Strike using Wine on a Linux machine

viewer" which can be used to view the email and also see the attachments, if any.

- **.prn:** a prn file is created when instead of clicking the 'print' button when you are printing something you click the 'print to file' button. A .prn file consists of number of pages, the printer to be used along with the text and

Imaging. If you are on a Mac, all you have to is drag the file onto the printer icon on the desktop.

- **.cbc/.cbr/.cbz:** these files are the most common file types comics books are distributed in. .cbc (comic book collection) consist of .cbr and .cbz file zipped together which can be easily extracted using WinRAR, or 7z or some other similar software. There are two popular ways to open .cbz (comic book zip) and .cbr (comic book rar) files, the simplest one being, using WinRAR or any other decompression software to extract the images out of these files. If you want to read the files directly then use any free software like CBR reader.


What do you do when all hope is lost?

So you came across a file type which we haven't listed and you don't seem to have a program installed that will do the job for you. You can spend some time googling around for the solution and the chances



fileinfo.com maintains a list of extensions including many obscure ones

the information to be printed. So what do you do when you come across it? If you are on Windows, you can either open the file through command prompt or by right clicking it and selecting Microsoft Office Document

are you'll find something or the other. But the fastest way to find out how to open a particular type of file is to go to www.fileinfo.com. Fileinfo maintains a huge list of file types and software, both paid and free, that can be used to open them on different platforms. 

MEET THE TRAILBLAZERS

THE FIRST STEP TOWARDS BECOMING YOUR OWN BOSS IS TO DO A LITTLE RESEARCH AS TO WHAT OTHER PEOPLE DID TO BECOME SUCCESSFUL

By Team Digit

Unless you've been living under a rock, you will have noticed that the past few years have seen a whole range of start-ups come into the limelight in India. From the large and obvious ones such as Flipkart, SnapDeal, Meru, and the likes, to smaller, sometimes localised start-ups, more and more businesses with interesting new ideas or unique ways of doing things are popping up. Yes, there's churn, and companies seem to come and go, or be bought over by larger companies, but the pipeline for new start-ups seems to always be full.

Does that mean stagnation? Too many people, too crowded in every possible category, and thus perhaps pointless? Not at all!

If it takes balls to build a startup now, it took beach-balls to do it five years ago (or really deep pockets). The pioneers, and the Indian rags to riches (or at least cheap hostel to expensive hotel) stories that have already taken place have paved the way for you to arrive on the scene. Your time is now, because those who've gone before you have proven that startups work here in India, and not just in a handful of cities but all over the country.

The all-important ingredient to success for you is venture capitalists (VCs), and the funding available now is huge thanks to all the previous success stories. The

world has its eye on India and is looking towards the young generation to carve their own success out of the pie. A 2014 NASSCOM study found that India was the fastest growing startup ecosystem in the world. The number of startups in India is expected to grow from about 3,000 in 2014 to over 11,000 by 2020.

HELP!

Thanks to the positive outlook for startups in India, many incubation programmes are being conducted with more cropping up every month. If you're graduating from a big college, your battle

is certainly going to be easier. The IITs, IIMs and other big colleges have in-house incubator programs that have supporting VCs monitoring ideas from students.

Also, yes, if you live and study in one of the big cities – Mumbai, Delhi, Pune, Hyderabad, Bangalore, etc – for startups, it does make life a little easier. However, in no way does this mean that living in any of these cities is necessary. There are many incubation programmes to be found all across India, and meetups are organised by VCs across the nation. All that really matters is that you have a great idea and a very good plan for how you're going to implement it.

TIMING IS EVERYTHING

Like Silicon Valley in its heydays, India is now ripe for the tinkers to pluck success from nothingness. The technology savvy, globally exposed (thanks to the internet, if not in person), creative and well-read generation has arrived in India. And no, we aren't only talking about people who create startups, but also the Indian consumer!.

The old foggies who were too scared to use technology, or refused to, and preferred the "old way" of doing things have finally died out or retired. If you're still working today, you're using technology in some form. Period. Technology is the fabled enabler. And almost all the startups you know or have read about are tech startups. Meru, for example, offers transportation services, but it's their technology compo-



Achitra Borgohain

Founder, BinBag

nent that sets them apart. Uber too. All of these are tech startups.

The success of e-commerce across the nation is in itself testimony to Indians having burst on to the technology scene. Your user base for that company you want to start has just hit critical mass! Everything from here on is a chain reaction that will ensure your user base keeps growing.

However, we ourselves are the old guard; the established business, the brand everyone already has heard of. What the heck do we know about startups? A very valid observation. That's why we spent the better part of a month talking to the people who actually started something... So let's take a look at what we found out when talking to startups.

EUREKA!

Like we've said before, the idea is a huge part of most success stories. When it hits you, you just know that the idea is worth following through on, however this involves a whole lot of work. Shaping your idea into something actually workable is your next step. Let's take a look at how some of the startups we interviewed arrived at their ideas.

Sometimes an idea strikes you when you have a need, and realise, after much searching, that there's no one fulfilling this need. For example, Achitra Borgohain, Founder BinBag.com, a startup that helps you recycle your waste responsibly, was frustrated when trying to dispose of household items herself. He says, "I tried calling recycling companies when I wanted to dispose of my old stuff (PC, Geyser, etc), and was told they don't pick up anything under 200 kgs! You can get new phones delivered to your doorstep, but there was no one ready to come and take away a phone you want to dispose of." In just eight months, BinBag has diverted over 3,000 kgs of waste to recycling plants; this is waste which would otherwise end up in landfills and poison the land and ecology.

Some ideas just come to you while still in college, or through a college project. Take the example of Jack of all Threads, a platform for crowdfunding T-Shirt designs started by Yash Vardhan Kanoi, Pratibha Nair and Apoorva Agarwal. "We started out as a t-shirt printing service for college students, and knew in our first few weeks that we wanted to

do more. We developed ways to involve buyers more in propagating their passions through unique concepts. The idea of the crowdfunding platform thus came soon after, as the necessary next step, nearly three years ago," says Yash.

Some others just want to do some good when they're already in a position of power. Sean Blagsvedt came to Bangalore to help set up Microsoft Research India, but ended up trying to bring the power of technology to those who wouldn't normally benefit from it. The result, BabaJob, a platform to help people find jobs in the

₹15,000 per month and under category. "In 2006, I came across a Duke University study that the primary path out of poverty for rural Indians was income diversification, usually by securing another job," says Sean. We all know this facet of India, when it comes to jobs for delivery boys, drivers, maids, etc., we want a reference, and job information often spreads only through word of mouth. Sean continues, "My immediate thought was if only we could digitise all the jobs, seekers and connections among people, we could catalyse the escape from poverty." Today, BabaJob



VC Speak with Alok Goyal of Helion Ventures

Who better to tell you about the pitfalls on the road to success than a venture capitalist? These are the guys who've seen a thousand startups start and fail. Better than learning from your own mistakes is learning from other people's mistakes, we always say. Here are Alok's 7 sins for tech startups:

- 1** The first pitfall is something that's been documented in a book called "The Founder's Dilemmas". The peril talked about has nothing to do with the market, the product or any of the common problems you may anticipate. It is to do with the founders not being able to get along through the journey of the startup. So distribution of equity, clarity of roles, governance processes in case of a disagreement – all these squishy topics need to be discussed and documented at an early stage.
- 2** You can't think you have a "unique" product because you have one or two different features from what's already available. That doesn't fly. Your product should at least satisfy two conditions: First, it needs to be a "must-have", and second, in needs to be 10x better than the existing products in the market.
- 3** Don't believe in your Kool-Aid too much. It's good to have a hypothesis. But it is more important to use the hypothesis with real data and customers' feedback. Do not be married to what your opinion was when you started the company.
- 4** "Kill mistakes quickly" should be your experimentation mantra. An experiment is not an experiment if it has been continuing for the past two years and still not working.
- 5** Don't put the cart before the horse. "Often I find that entrepreneurs are putting in a lot of money in scaling when the product market fit doesn't exist," says Alok.
- 6** Many entrepreneurs, especially tech-based startup guys, have the notion that once they build a product, people will buy. Unfortunately the world doesn't work that way. Sometimes even a not so great product can win the story because the founding teams have a very strong marketing and sale side. Don't ignore marketing.
- 7** Managing your growth capital is very important. Don't under raise or over raise. Similarly hiring decisions are tricky. Many startup founders will either not hire for a long time or will hire people who are not truly upto the mark. It may be either because of the fear that people will not come in or because of the fear that they will lose too much in the process.

has over 30 lakh job seekers and 2 lakh registered employers.

Sometimes already successful people also get bitten by the frustration bug, as happened to Beerud Sheth, CEO of Webaroo, the messaging company behind SMS GupShup. While trying to message people in his company using an existing enterprise messaging app, he got so frustrated, he broke his phone. "That's when I decided to launch a product which enables clutter free communication in an enterprise," says Beerud. That's how their product Teamchat was born.

Not all problems are local however; some are global. Livspace, an end-to-end décor and home design provider, was started because all three of its founding members (Anuj Srivastava, Shagufta Anurag and Ramakant Sharma) were frustrated with a lack of trying to design their homes. Let Anuj tell you in his words, "The idea of Livspace was inspired by our combined frustrations in India, USA, and Singapore while getting our homes designed and realising that instead of it being a fun, enjoyable experience — it's a nightmare!"

BE UNIQUE

It's not enough to go "Eureka!", and then just do something that's already being done or can be easily copied. Even when you see the need for something, and find that people in other countries are already doing it, you need to tailor fit your solution to the place and the people who will use it.

Let's start with the real world examples again; first up, Karthik Ramachandra, co-founder TripHobo. In the age where machines replace humans on a regular basis, he saw value in doing the opposite. At a time when most travel portals try and offer you a things to see list and try and throw up algorithm generated itineraries, tripHobo decided to focus on making user generated content more accessible. Karthik says, "People talk to other people to discuss and debate when they create a trip plan. This is something we've tried to replicate on the portal. With a massive repository of itineraries created by real travelers, one can easily find something that suits them. Users can edit and customise itineraries already on the portal, and then those get saved as more suggestions for other users."



Anuj Srivastava

Co-Founder and CEO
Livspace

It's also important to understand local needs, which may differ wildly from those abroad. MySmartPrice is a popular price comparison platform with 10 million users across India. Sitakanta Ray, Co-Founder and COO, says, "The product we built was in part inspired by Nextag (US) and Shopping.com (UK). However we tailored our product to the shopping needs of the country. For example, MySmartPrice has integrated the offers and coupons of var-

ious stores directly into the price table. So users don't need to go to another destination to find the best coupon for the product they are buying. We also show delivery and payment options such as COD, availability of EMI etc, all in advance."

You can also be unique by totally rethinking things inside a niche. All of us run in search for C.A.s to file our returns come tax season, and the founders of MeetUrPro.com already had experience in running web sites for people like us, with two successful sites that helped people file tax returns. However, as they sat around thinking what the next steps in their growth might be, they realised that they had to go beyond the people they could hire. Instead of trying to provide services, they decided to become the platform itself. "As we deliberated on the possibility of expanding the delivery team for multi-disciplinary consultation – we thought of bringing in multiple professionals as partners similar to a market place – hence the thought of MeetUrPro.com," says Divakar Vijayasarthi, Co-Founder MeetUrPro.com.

Then there are enterprise-level players who strike gold with an idea. Take JunoTele, a mobile payment technology company with solutions deployed in India, Sri-Lanka and Thailand. Most mobile micro payments happen using

Where do eureka's come from?

While there's no magic formula, it doesn't mean that there's no formula at all. For a headstart, read Paul Graham's brilliant and detailed essay titled 'How to get startup ideas'. To read it, head over to <http://dgit.in/GetStartupIdeas>

Straight from the horse's mouth

Learn directly from other entrepreneurs and successful businessmen on websites such as 'Quora', where asking a broad question in a relevant category (such as 'Startups') can reap some very high-quality answers. Meanwhile, due to the fact that so many successful tech industry figures are members of Quora, you can ask questions directly to them, or about them, and with a bit of luck you'll get an answer right from the horse's mouth.

'Mixergy' is another website where you can "learn from proven entrepreneurs" like Paul Graham and Jimmy Wales. These aren't five minute gloss overs, they're in depth and detailed descriptions of how these successful people got to where they are today.

If you can't be bothered to come up with your own ideas

Ideaswatch.com: Lets users share ideas and what they'd like in the market. You can even form a team of like-minded individuals to pursue an idea.

Springwise.com: Provides a collection of proven successful ideas from many countries to try out on your own.


Killerstartups.com: With over 15 new startups submitted everyday, the site is popular among early stage entrepreneurs looking to promote their babies.


The DOs and DONTs of establishing tech startups





Dhruv Agarwala


Co-Founder and CEO, PropTiger tells you some of the fundamental DOs


 **Be different:** Be clear about why your business is different and what you can do differently from others. PropTiger.com, for instance, is an advisory firm which helps home buyers at every level of the home buying process right from searching for properties to registering their homes. This is the full stack of services only we offer.


 **Find the right investor:** A number of founders tend to accept investments from anyone and everyone. But before getting investors on board, it's important to talk to other founders of businesses they have invested in to get a sense of what working with them is like. It's also important to think about the time horizon for their exit and to also assess if they are in sync with the market and prospects of your business.

 **Raise money intelligently:** Raise as much as you would need and then spend strategically. And, what works in favor of technology-based startups is that they don't need much to build.

 **Find the right people:** It's very important to partner with people who complement your skills. However, avoid getting too many people on board, as it might become tough to find common vision. Above all, ensure that whoever you work with aligns with your values and your vision.

 **Be sure and flexible:** Be sure to constantly test your idea in the market and seek feedback. When the feedback suggests changes to the original hypothesis, do have the courage to modify it without compromising on the fundamental vision.


 **Meet everyone you hire:** This may sound outlandish but do make the effort of meeting everyone you plan to hire for your company. Don't make the mistake of outsourcing hiring to others.


 **Be creative:** Often, founders make the mistake of spending too much money to grow business. One doesn't need to spend a fortune. One needs to be creative about businesses and how they can solve problems of customers. There is no substitute for creativity.





Yosha Gupta


CEO & Founder, LafaLafa points out the DONTs


 **Don't be a perfectionist:** Waiting to launch the perfect product, will never happen. launch your MVP (Minimum viable product)

 **Don't launch too soon:** I know this sounds like Paul Graham's list now but I've actually seen it as I was with mobile payment startup PayMate 8 years ago and a lot of what we did is similar to Paytm and Mobikwik now but it was just ahead of its time as ecommerce hadn't taken off there was no smartphones while we were trying to do mobile payments using IVR and SMS which wasn't convenient for customers.

 **Don't take the technology lightly:** Not having a Tech Co-Founder, even with 10 years of Product background, it gets hard for me sometimes. It's quite unimaginable how people with no tech background think of launching tech startups without a tech co-founder

 **Don't underrate commitment as a trait:** While everyone talks about hiring good programmers and how one good programmer is better than five OK programmers, my experience has been that hiring the initial development team only based on skills is not always right. For the initial set of hires, commitment and resilience rank way higher on the scale than pure skills alone.

 **Don't ignore Opensource:** Spending too much development time in building features which might be available via open source or through other startups is counterproductive. Before building any features check if there are other startups which specialise in providing features as a SaaS product for e.g. At LafaLafa, we use Zopim for customer Chat, WebEngage for website engagement and feedback forms, Parse for app push notifications, MAT for app attribution tracking. Use companies like Targetting Mantra for recommendation engines instead of building your own.

 **Not documenting anything:** Well documented and commented code is extremely important, especially when new members join the team.



Divakar Vijayasarathy
Co-Founder, MeetUrPro

mobile data. When on Wi-Fi, carriers in developing countries find it hard to capture the mobile number, and thus they found that 30 to 45 per cent of transactions were failing. That's a huge loss for telcos and a huge source of frustration to users like us who wouldn't understand why transactions failed. B Sekhar Rao, founder and CEO JunoTele says, "No payment gateway in the world (Credit cards, wallets, PayPal, carrier billing etc) has the ability to authenticate the validity of the mobile user or the transaction without the availability of an active data connection. JunoTele has the ability to do that as long as the voice network of the Mobile user is enabled. This opens up significant possibilities for any payment mechanism in the world to complete a transaction even in remote areas or data offline areas." Yes, you read that right, JunoTele figured out a way to even authenticate transactions where there is no data coverage at all!

CHANGE IS THE ONLY CONSTANT

Not everything will go as you want, and it's important that you realise that sometimes you have to look ahead and solve for problems that aren't even your fault to begin with. Or else, market scenarios might change overnight, and you will need to rethink strategies.

Eduator, a digital learning company that wants to educate India using tablets, and has already reached 40,000 students across India. Eduator's product is IGNITOR, and they work with principals, students, teachers, parents and even

publishers to try and make an enriching e-learning experience. They faced a lot of challenges though, especially with hardware. Tablets were either very expensive or very poor quality when IGNITOR was being developed, and they had to design it with very low processing power in mind. They also had to consider that most schools across India will have little or no IT infrastructure, and thus had to keep that in mind. Publishers are another problem, as they hate the digital medium, because of piracy, so a lot of time was spent on securing the content. Ram Gollamudi, CEO and Founder Edutor Technologies, is still thrilled with the possibilities, despite the hardships: "The current trend includes rapid innovation and lot of ideas on how to transform the antiquated education system in India with new tools and pedagogy styles. Exciting times ahead for Ed-tech 2.0 in India!"

Of course you could always startup a startup whose clients are startups, and thus have a startup in a startup-loving market that takes advantage of the startup boom! (That's about as many times we can say "startup" in a sentence and still make sense...)


We're talking of Talent Pad, a job marketplace for both recruiters and candidates that's aimed specifically at technology jobs. Why? Because all startups today need good resources (especially after a round of funding) and that means that technology and product management personnel are always in short supply. So what does Talent Pad do? It curates thousands of CVs, short-



Sitakanta Ray
Co-Founder - MySmartPrice

lists the cream of the crop (roughly 10 per cent) and finds them job offers from a range of companies. Most job portals are targeted at keeping the recruiter happy, but Talent Pad gives both equal importance. The candidate chooses which offers he or she wants to consider, and then Talent Pad lines up interviews. Over 6,000 interview job offers have been made to candidates, worth over 1000+ crore (in salaries) by over 200 companies. Says Mayank Jain, CEO and Co-founder Talent Pad, "The current trends in the market reflect on the talent supply gap and a shift of power towards candidates rather than the recruiters. Factors such as competition of talent between firms, premium talent having multiple options and most importantly the change in approach towards job search by candidates who are giving preference to personal growth rather than hefty salaries are some of the trends driving today's job market. We understand this demand, and have customised our platform to address the need for a robust, premium, transparent recruitment platform."

GET STARTED

So what are you waiting for? Quickly finish reading the rest of this cover story and get started on your startup. Fortune favours the brave and all that... Remember to write in to us (editor@digit.in) as well, and give us feedback, tell us about your startup idea, or lament with us, if you, like us, have had wonderful ideas before someone else implemented it. <insert sad smiley here>. 



Yash Vardhan Kanoi
Co Founder, Jack of all Threads

EUREKA!

IDEAS DON'T COME AT YOUR BECK AND CALL. THEY ARE ELUSIVE THINGS, TO BE NURTURED AND INCUBATED AS THEY COME, SO MAKE SURE YOU WRITE DOWN THAT INSANE IDEA YOU JUST HAD. IT MIGHT JUST MAKE YOU A MILLIONAIRE.

By Anshumala Balu

A spontaneous idea can hit you like a bolt from the blue. It can come to you anywhere, any time – while hiking, napping, socialising and indeed, while bathing. Fortunately, most people who stumble upon an idea resist the urge to run out into the street yelling “Eureka!”. However, there’s a common trait among most of these unbidden startup ideas, and that is how audacious, stupid or crazy they initially sound. While executing these in the Big Bad World is a whole different ball game, hope presents itself in the form of potential.

Inspiration is everywhere! All you have to do is keep your eyes peeled. Like these guys did.

THE CALCULATOR

In 1642, French prodigy Blaise Pascal designed the first counting machine at the age of 18. The contraption, a device that

“My ideas usually come not at my desk writing, but in the midst of living.”

– ANAIS NIN

could perform all four arithmetic operations without relying on human intelligence, was created to help out his father, who happened to be a tax collector. Called the ‘Pascaline’, the machine relied on geared wheels and could add and subtract two numbers directly as well as multiply and divide by repetition. It was basically an early form of the now standard calculator. He made



Oh, Archimedes

somewhere between 20 to 50 of them, however nobody was interested in them at the time. It was only 300 years later that the calculator became all the rage and he was established as one of the two early inventors of the mechanical calculator – the other being Wilhelm Schickard.

THE POPSICLE

One cold evening in 1905, 11-year-old Frank Epperson left a mixture of powdered drink mix and water with the stirring stick in a cup on the porch of his house. Given the frigid temperatures in San Francisco at that time of year, he woke up to find a frozen treat on a stick. Excited by his invention, he continued to make these ice pops for friends. It was only a matter of time before he realised their commercial viability. They were a



Pascaline – the first calculator

huge hit. He named the accidental invention ‘Epsicle’ after himself. Eventually, when his kids started calling them “Pop’s ‘sicles”, Epperson officially changed the name to ‘Popsicle’ in 1923.

VELCRO

In 1941, Swiss engineer George de Mestral and his dog went for a nature hike, after which the man and his best friend returned covered in burrs (the seed sacs plants use to pollinate). Being an engineer, de Mestral grabbed a microscope and the rest is history. He saw the small hooks vigorously clinging on to the tiny loops in the fabric of his pants. We hope he remembered to brush his dog after. His idea for a hook-and-loop fastener was initially met with condescending scepticism by the European fabric industry, but the inventor “stuck” by his decision. It took another 14 years to patent the “zipperless zipper”, and in 1999, de Mestral was inducted into the USA’s National Inventors Hall of Fame for being the founding father of a multi-million dollar industry. The word “velcro” is derived from the French words “velour” (velvet) and “crochet” (hooks). So essentially, Velcro just means “hooked velvet”.

LAMBORGHINI

Ferruccio Lamborghini was a farmer turned entrepreneur, who originally owned a tractor company and was already one of the wealthiest men in Italy at the time. Being a car lover, he owned many sports cars including the Ferrari 250 GT. He noticed that the clutch in his car was the same one he had put in his tractors. Over time, he grew tired of recurring problems with the car’s clutch and decided to approach Ferrari himself.

Enzo Ferrari's haughty response was, "The problem is not with the car, but the driver!" He went on to advise Lamborghini to go back to taking care of his tractors (*gasp*). For Ferruccio, this was not only an insult but also an open challenge, and it was the reason the world now has Lamborghini super cars, heralded by the Lamborghini 350 GT in 1964.

PET ROCKS

Gary Dahl was a 38-year-old advertising executive from California when he invented the pet rock. He went out drinking with his buddies one day in the April of 1975. The conversation turned to conventional pets and how they required so much of an owner's time and energy. They conjectured how conversely awesome it would be to own a pet rock – they're easy to maintain, cheap and had a great personality.

Dahl spent the next two weeks writing the 'Pet Rock Training Manual' with step-by-step instructions on how to have a happy relationship with your geological pet. He included an actual rock (A beach stone from Rosarita, Mexico) in the gift box shaped pet carrying case,



Man's more convenient best friend

complete with air holes for breathing. A million rocks sold for \$3.95 (~₹250) a piece in a few months and Dahl became a millionaire.

"Place it on some old newspapers. The rock will never know what the paper is for and will require no further instruction."

"I can think of several heuristics for generating ideas for startups, but most reduce to this: look at something people are trying to do, and figure out how to do it in a way that doesn't suck."

– PAUL GRAHAM

FACEBOOK

'The Social Network' is a commendable drama film, but how does it hold up to reality? The basic plot line is fairly accurate, but Mark Zuckerberg himself said that the movie "made up stuff that was hurtful".

Mark, a keen computer programmer, at the age of 23, had already created websites like Course Match and Facemash. The former allowed users to view others taking their courses, while the latter allowed ranking of people based on their "hotness". In February 2004, Zuckerberg created a website called 'The Facebook'. The name was taken from the sheets of paper detailing the profiles of students and staff that was handed out during his freshman year. Within 24 hours, 1,200 Harvard students had signed in and after a month it was half the undergrad population. In September 2006, the reach of the website had extended to anyone with a registered email address. Till date, the site remains free to join, with the welcome page declaring: "It's free and always will be". Although the birth of the site was marred by legal cases by various individuals claiming ownership, both Yahoo! and Google expressed interest in a buy-out. Zuckerberg has decided that he will not, in fact, be selling.

KHAN ACADEMY

Salman Khan (not the actor) has proved that his crazy mission for free, world class education for anyone, anywhere is well on its way to becoming a reality. However, this isn't what he had in mind when he initially started out. In late 2004, Khan began tutoring his cousin Nadia in 7th grade mathematics using Yahoo!'s Doodle notepad. When other relatives and friends sought similar help, he decided it would be more practical to distribute the tutorials on YouTube. The exponentially increasing popularity and the testimonials of appreciative students prompted Khan to quit his job in finance as a hedge fund analyst at Connective Capital Management in 2009 and focus on the tutorials (then released under the moniker 'Khan Academy') full-time. From basic addition and subtraction

to highly complicated algebra and calculus, Khan Academy tutors its users on topics that include a wide array of topics in science, economics, finance and humanities. It even has test prep help. Khan is one of the fore-runners in the coming overhaul of the global education system.

SNAPCHAT


Formerly called 'Picaboo', the company now valued at \$800 million gave everyone a hard time getting their minds out of the gutter during its infant days. It's absurd that an app that simplifies sending lewd, profane or even innocent photos only to self destruct after a few seconds could be such a huge hit. Snapchat was launched in 2011 by two Stanford grads – Evan Spiegel and Bobby Murphy. It allows users to send images and texts privately, away from prying eyes. Looks like pictures speak louder than words. Originally, the idea was to create a website that required users to upload

"Ideas are like rabbits. You get a couple, learn how to handle them, and pretty soon you have a dozen."

– JOHN STEINBECK

photos and set a timer before sending them. Then an Aha! moment occurred and the duo decided to turn it into an app, since phones already have a camera.

THE BRIGHTEN APP

In 2013, while studying abroad in South Africa's Bucknell University, junior Austin Kevitch was devastated when a friend tragically died in a rock climbing accident. He was heartened, however, by the wonderful comments being posted on his friend's Facebook page. The comments inspired him and another friend to create a "compliment box" at their campus house, into which people could write and submit anonymous positive messages on sticky notes to roommates and friends. Reading the notes became such a daily highlight that Kevitch decided to spread the good vibes beyond his circle of friends. His Brighten app lets users anonymously post uplifting messages and words of encouragement to people they know. Its simple mission was "to make the world a happier place by improving the way people interact and view one another." 

DE-STRESS TO IMPRESS

FOR ESTABLISHING A GREAT STARTUP YOU NEED TO COME UP WITH AN IDEA. HERE ARE SOME PROVEN TECHNIQUES TO HELP YOU IDEATE

By Nachiket Mhatre

It's said that the human brain may not have any iota of muscle fibre in it, but it still tends to behave like a muscle to some degree. Like the weak and practically useless muscles of a new-born human child, the infant brain is a smoother and tiny version of the large and wrinkled adult brain. Just like a muscle, the brain needs exercise for growth. A child's overactive imagination makes it rapidly expand and fold upon itself forming wrinkles and dramatically increasing the grey matter. And again much like a muscle, the brain tends to get fatigued with overuse.

This isn't just a minor inconvenience, but a big problem. That's especially the case in an age where billion dollar corporate entities are erected from the foundation of winning ideas. While brain fatigue or mental block may be a non-issue for a regular blue-collar worker, it has much serious implications in the cutthroat world of startups. Anything that impedes the startup think tank is a matter of serious concern in an economy that's driven by ideas and deals in the currency of innovations.

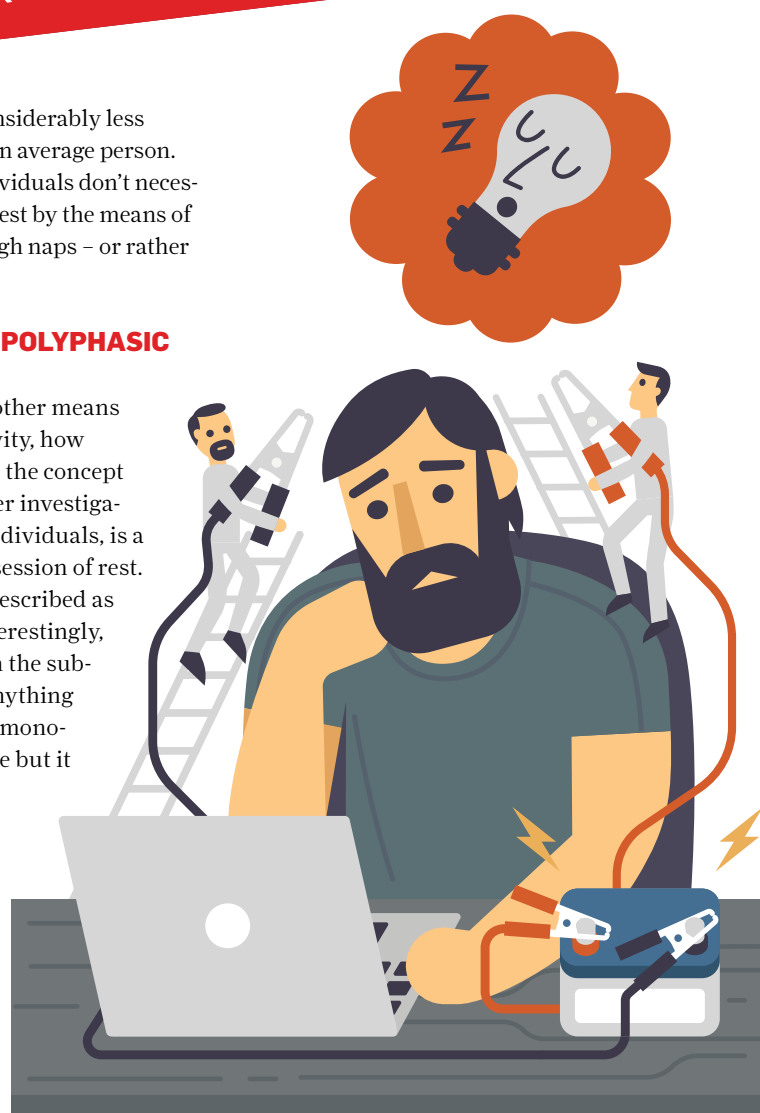
The good news is that although the brain behaves in ways similar to muscles, reinvigorating the soft grey mass of jelly floating about in the cranium thankfully isn't a one-track affair like its muscular counterpart. Rest is the ultimate reset switch that replenishes creative juices, but it isn't the only means of doing that. That's a godsend considering how most over-

achievers tend to get considerably less amount of sleep than an average person. These resourceful individuals don't necessarily tend to achieve rest by the means of sleep, but rather through naps – or rather power naps.

RESTING SMART: POLYPHASIC SLEEP CYCLES

Before we dissect the other means of rejuvenating creativity, how the pioneers approach the concept of rest warrants further investigation. Sleep, for most individuals, is a single uninterrupted session of rest. This is academically described as monophasic sleep. Interestingly, research conducted on the subject reveals that like anything large and continuous, monophasic sleep is effective but it isn't quite efficient.

Military research groups belonging to various countries as well as NASA – or in other words, any organisation with a pressing need to squeeze the most amount of productivity in the least amount of time – have found that polyphasic sleep significantly reduces the amount of time lost to rest. This approach to sleep essentially splits it into a multiple short naps with a view to minimise the total time spent sleeping. Tests with various



versions of polyphasic sleep cycles ranging from four to just two hours of total sleep, showed no noticeable decrease in mental alertness or memory capability when compared to a normal eight-hour monophasic sleep cycle.

Historical overachievers such as political and military masterminds such as Winston Churchill and Napoleon Bonaparte as well as prolific inventors such as Nikola Tesla, Thomas Edison, and Leonardo Da Vinci have been known to practice polyphasic sleep. That pretty much explains how these individuals managed to get so much done in their time. However, the long term effects of reduced sleep are yet unknown, so try this at your own risk. Having said that, polyphasic sleep makes perfect sense during crunch times when increasing productivity is a do or die affair.

DE-STRESSING THROUGH TECHNOLOGY

Now that we have figured out how to rest, it's time to notch that a few steps further in a more relevant manner – through gadgets and technology. But before we get to that, it must be noted that so far we have conclusively learned that genius-level military tacticians and prolific inventors evidently know how to work their brains long and hard without fatigue. Therefore, it makes perfect sense to take cues from their present-day counterparts. Although the absence of wars in the modern world rules out the former category of geniuses, thankfully inventors aren't in short supply.

Meet Dr Yoshiro Nakamatsu. Widely known as the Edison of Japan, this prolific modern-day inventor is credited with inventing the floppy disk, CD, DVD, and over 3000 other patents to his credit. Like his historical counterparts, the eccentric genius doesn't sleep as long as regular people. He augments his four-hour core sleep with twenty minute power naps. He takes these power naps on a specially designed chair dubbed Cerebrex.

The chair is yet another one of his inventions that is a cut above the rest. Nakamatsu claims that the Cerebrex employs technology to improve mental acuity by boosting memory and math capability in addition to stimulating creativity. The chair achieves this by subjecting the body to sonic frequencies to stimulate blood circulation and make the brain perform better. The Japanese inventor claims that just twenty minutes of rest in his chair has the same effect as eight hours of sleep.

Fortunately, you don't necessarily have to make a beeline for Japan to get your

own brain rejuvenating chair. If you don't mind spending upwards of ₹80,000 on a chair, you can choose between recliners with built in massage function and full-blown massage chairs. They lack the fancy sonic massage feature of Dr Nakamatsu's Cerebrex, but an increasing number of corporate executives employed in high stress jobs are lapping up these comfortable recliners. This isn't just needless extravagance. It's a great investment that could go a long way towards reducing stress and increasing productivity.

FUELLING CREATIVITY WITH OXYGEN

If you thought sonic chairs for stimulating the brain treads the territory of weird and eccentric, you ought to hear what Dr Nakamatsu does for creative inspiration. The inventor has a penchant for coming



Listening to your favourite tunes can, for a short time, boost your brain power, even (*ugh*) for Beliebers!

up with his best ideas under water. He does that by diving underwater without any artificial breathing apparatus and just a specially designed plexiglass tablet to jot down his ideas. The logic behind this exercise is the inventor's theory that oxygen deprivation is a great catalyst for creativity and that the best ideas conjured when you're at the verge of drowning.

"You must dive deep and allow the water pressure to deprive the brain of blood," explains the 86 year old inventor. "Zero point five seconds before death, I visualize an invention." This may seem an awful lot like the weird and potentially fatal fetish of autoerotic asphyxiation that claimed David Carradine of Kill Bill fame,

but there's a method to this apparent madness. Dr Nakamatsu believes that the sudden rush of oxygen to the brain reinvigorates it, which in turn helps with creativity and inspiration for killer ideas.

Yet again, there's a much better and more importantly safer way to do the same thing. Just visit a bar. Not just any kind of bar – mind you – but an oxygen bar. Yes, these bars serve oxygen and they were introduced in Indian metros as far back as 1998. Like all things eccentric, this concept too emerged out of Japan in the early '90s. These bars were set up as a means for health conscious individuals to combat oxygen deprivation caused by increasing pollution in cities. An hour long session in an average oxygen bar costs between ₹300 to 1000 depending on whether the gas is delivered through a cylinder or inside a specially designed chamber.

Regular sessions are touted to deliver a host of benefits ranging from anti-ageing, boosting immunity, and improving sleep cycle to curing various medical ailments. However, there's no medical proof to back up any of those claims. This concept is nevertheless derived from hyperbaric oxygen chambers used by the military, diving industry, and even in hospitals to treat burn victims. Supplying injured patients with 100 percent oxygen at high atmospheric pressures has been found to rapidly accelerate the body's healing process. The veracity of the medical benefits notwithstanding, breathing scented oxygen at one of these places should be refreshing enough to kickstart your brain.

ALL WORK AND NO PLAY

In a distinct departure from bizarre means suggested thus far to refresh the brain, videogames definitely rank as the most popular and fun way to de-stress after a long day. This widely practiced hobby is generally associated with all the negativity in the world thanks to an attitude borne out of the belief that if something is enjoyable then it must be bad. For example, the most common refrain of concerned parents about videogames is that it makes their kids go blind and dumbs them down.

Research has found that playing twitchy FPS games actually improves vision and the ability of the brain of process visual information. Far from dumbing gamers down, videogames

achieve the exact opposite – playing videogames makes them smarter. Research conducted by University of Rochester shows that they improve decision making skills, perception, and boost creativity. Tests reveal that those who play action-oriented videogames have better cognitive capability than those who don't.

The difference is stark, with gamers being able to make decisions 25 percent faster and with greater accuracy than those who don't play videogames. On an average, gamers can pay attention to six different things at once, as opposed to four for non-gamers.

What's more, playing Real Time Strategy games significantly improves cognitive flexibility according to research done in UK on the subject. "Previous research has demonstrated that action video games, such as Halo, can speed up decision making but the current work finds that real-time strategy games can promote our ability to think on the fly and learn from past mistakes," says Dr Brian Glass from Queen Mary's School of Biological and Chemical Sciences. "Our paper shows that cognitive flexibility, a cornerstone of human intelligence, is not a static trait but can be trained and improved using fun learning tools like gaming."

So do yourself a favour and unwind with a round of Super Meat Boy or StarCraft II the next time your mind goes blank after some serious brainstorming. Science says that not only will you come away a little bit smarter, cognitively faster, and with improved eyesight, but doing so will also get rid of mental fatigue and help you approach work with a fresher perspective. Getting these benefits doesn't necessarily entail staring into a screen. Tabletop Role-Playing Games require a great deal of creativity and imagination and stimulate the brain. Although they aren't quick or convenient means of unwinding, it's lot more satisfying to get invested in epic adventures with your friends and co-workers.

MUSIC: COGNITIVE QUAD DAMAGE

The videogame industry categorically shadows the music industry in sheer scale, but it still doesn't enjoy the universal acceptance as a pastime. Music, on the other hand, is the common denominator that appeals to practically everyone

irrespective of gender, race, or socio-economic background. It's definitely the most accessible form of electronic entertainment medium. Furthermore, its ability to evoke strong emotions makes it an inherently cathartic experience. Listening to your favourite form of music is undoubtedly the easiest and the most effect means of de-stressing yourself.

However, the many virtues of music go beyond mere stress relief. A popular study featured in the journal Nature back in the '90s established a link between western classical music and brain development. The study found that listening to classical music tends to improve brain power. The media attention surrounding the study was large enough to warrant a catchy new term capturing the mind-enhancing powers of music. The Mozart effect eventually caught on and prompted parents to play western classical tunes to infants in the hopes of making them smarter.

Does that mean you have to give up your Cannibal Corpse playlist in favour of Beethoven and Mozart? Well, not really. It was later found that the original study wasn't exactly very scientifically sound. It didn't have a large enough sample size and the cognitive improvements lasted only for a short amount of time. More thorough research on this phenomenon confirmed that the positive effect on brain function was only temporary. Furthermore, it was also found that this effect wasn't solely restricted to western classical music.

When the tests were repeated on children, they performed well with Mozart, but the results were even more


impressive with pop music. The upshot is that cognitive improvement manifests simply by the virtue of listening to music that you enjoy. So technically, even Yo Yo Honey Singh fans can potentially become smarter by listening to his music – relatively speaking, of course. Even though the improvement is only temporary, it can still be considered as a power up of sorts. Got stumped by a particularly devious problem? Just listen to your favourite tunes and re-approach it with the cognitive equivalent of Quad Damage.

DE-STRESSING AT AN ENDOCRINAL LEVEL

Stress is often erroneously considered a psychological phenomenon, but it's more psychosomatic in nature. It causes the endocrine system to secrete cortisol – a primary stress hormone responsible for elevating the risk of diabetes, weight gain, suppresses the immune system, damages organs, and increases blood pressure among many more potentially hazardous physiological effects.

Before you worry and elevate your cortisol levels, you might want to know that exercise is the best way to burn away cortisol. Moreover, physical activity also causes the body to secrete endorphins – the body's natural painkiller that also induces a feeling of euphoria. That's right – working out not only kills stress and prevents your body from harm, but it also makes you genuinely and manifestly happy.

That explains why working out for just ten minutes a day puts people at risk of spamming inspirational gym quotes through their Facebook feeds. But jokes aside, nothing can reset your brain and get you in an upbeat mood as effectively as pumping iron in the gym or simply heading out for a quick jog. Doing that will not only get rid of your mental block, but it can potentially unblock clogged arteries as well.

So there you have it – half a dozen ways to de-stress and get your creative juices flowing. Some of these are practical whereas others sound improbable. The easier ones may seem good enough, but the really challenging ones promise greater rewards. You might want to try the ones that seem most approachable, but when the idea is to de-stress it's best not to sweat it and give them all a shot. 



You can rejuvenate your brain by taking a power nap in your favourite chair, and just a 20 minute nap or so

Recommended buys

Top products across most popular categories, so you don't have to scratch your head and wonder

Price Watch

We list out Gaming Monitors, CPU coolers, cabinets and graphics cards in this month's Price Watch

A VRy tough decision

With all the big VR devices nearing launch day, which one would you buy?

Agent 001

agent001@digit.in

At first, 2014 was purported to be "The year of the VR" and then 2015 has been called the same. Given all the release news around this new segment, I now feel that I too must add my voice to the chorus except for one minor difference. The year will be 2016. And this isn't a prophetic declaration, we know that all consumer VR units will finally be available in the coming year. Valve and HTC's VIVE is slated for a November 2015 launch which we Indians might not be able to get our hands on for quite some time. Sony's Morpheus will hit the shelves sometime in the first half of 2016, and if Sony's PS4 launch in India is anything to go by then we might end up seeing the device a few months after the international launch with a hefty price tag thanks to the "current Indian tax structure." And lastly, we have the Oculus Rift which finally has a release date in the first quarter of the coming year. You can see where I'm going with this.

Technology wise the three giants will try to match each other. Oculus' consumer version is expected to come out with a 2160x1200 display running at 90Hz. On the other hand HTC's Vive will have 1200x1080 panels for each eye and they're both running at 90Hz. Lastly, Sony's Morpheus will have 960x1080 panels for each eye. While the Vive seems



HTC VIVE a.k.a. SteamVR

to have the lead here, there's the fact that the hardware that has to drive these devices will require quite the horsepower. Moreover, since Morpheus is restricted to the PS4, something that Sony rules over with an iron fist, you can rest assured that your experience will be uniform across all titles that support VR on Sony's console. The Vive and Oculus don't have it easy, not only is the hardware requirement for either unit astronomical, the two ecosystems aren't as controlled as Sony's. Valve might take a few steps to ensure a good experience for the games released on the Vive but Oculus is playing on a completely open playing field. On a recent blog post they'd outlined the recommended specifications for the consumer version of the Rift. An Intel i5-4590, NVIDIA GTX 970 or AMD R9 290 and 8 GB of RAM will cost you about ₹40K and the remaining components should jack the price up by about ₹20-30K. All things

considered, a Rift capable system coupled with the Oculus Rift itself should set you back by about \$1,500 (or ₹95,000). That price is a bit steep indeed.

For years upon years, I've been classified as an early adopter but this is one thing that seems way too much for the money. I have the GTX 970, 16 GB of RAM and an i7-3770K, so hardware isn't a concern for me, but it is a concern for most gamers. Few gamers have access to anything more than integrated graphics and if the Rift was niche before, the requirement of a 970 (OK, it's only the "recommended" hardware, but still...) makes it even more niche. I'm almost tempted to get the DK2 and would have gotten one already if it weren't for the glaringly painful drawbacks. It's quite heavy, has latency issues and a noticeable screen-door effect owing to the lower resolution.

There are cheaper VR devices, but most of them have partnered with some

Killer rigs

A PC can be of any configuration and price point. We do exactly that, list out set combinations at different prices.

content provider or the other and have become exclusive – a word I've come to hate for quite some time.

So I'm not going to jump the gun this time. All three competitors seem to show promise but within the first few months of their release we will see the market starting to favour one among the three. And I'm hoping it might be the SteamVR and most probably I can kiss goodbye to all the new upgrades I'd planned.

P.S. - The year might be 2017...

Gaming laptop for ₹40,000

Hi Team Digit,

I have a mid 2011 MacBook Air and am thinking of getting a gaming laptop. My budget is around ₹40,000. Please suggest a good laptop. Also in the May issue of SKOAR! The article on the death of gaming consoles had a table comparing the next generation consoles to a PC. Could you please send me the rig and the price. Thanking you in advance.

– Dhimant Ananmay

A Gaming at ₹40k is not an ideal scenario at all. Laptops being a more portable package than desktops, offer a lot less in terms of performance for the same price. Moreover, laptops available at this price point aren't designed to withstand the generous amount of heat generated during gaming. So you'll be reducing the life of your laptop by a sizeable margin if you run resource heavy games for extended periods. You can game as long as you are careful about temperatures. Run a temperature monitoring utility in the background like RealTemp or even Speccy for that



ASUS X555LJ-XX177H

matter since it records temperature over time. If the average temperature recorded during your gaming sessions are way higher than 60 degrees then you need to ease up on the graphics settings. This process may be a little tedious but it will help. As far as recommendations go, there are very few

WHAT YOU LEARN FROM MAKING GAMES

Games bring out the best in people. Their problem-solving skills are put to the test. If there was ever a challenge players of a good game relished, it was finding out the answers to a problem posed to them by another human being. A system built by other people proves far more engaging than beaten-up forms of linear mental stimulation.

As a designer, the skill set lies in posing new challenges creatively and in posing existing fictional and real-world challenges differently. This skillset had already been perfected by the time games were being considered for use in solving real-world issues - at first to train commercial jet pilots in being attentive to take-off, landing, in-flight and radio procedures; then to train regular people to drive, and enforcing civil behaviour among drivers by giving them immediate feedback on their performance in simulated environments; and finally to achieve major scientific breakthroughs.

Through hours spent in play, a 2010-developed app called Foldit gave scientists the data they required to solve a medical problem that baffled them for over 13 years. In three weeks, players resolved the structure of an enzyme causing recurring HIV in monkeys, all by puzzles translated

from protein-structure to on-screen spatial problems. The human mind has the innate ability to recognize patterns and solve what doesn't sit right with its logical side. Taking advantage of these puzzle-solving intuitions and encouraging competitive gameplay to fold the best proteins, they were able to reach a cure in a short span of time.

Another such example, Planet Hunters, has players interact with the universe to discover and explore entirely new solar systems in search of planets. The collaboration of scientists and gamers has not only allowed them to accelerate research enough to spend time on the right things, but it also gave them the work-force they needed to make consistent breakthroughs for the good of humanity.

When designers let go and watch their games at work, they find many immediate fixes and improvements that would otherwise not have been possible. So if you're a designer or are looking into the industry as a student or a non-gamer, this is what you need to know. Forget pressure and panic, and embrace play with open-mindedness. As gaming flourishes in the fields of astronomical and scientific research, game designers will soon internalize the skill of creating compelling games that push players' problem-solving capabilities to the next level.

For more visit www.dsk.digit.in.



Gaming teaches you lots of things



Trial by combat

Who would you have picked to fight the Mountain on a Trial by Combat? Check out these interesting answers to the question on quora <http://dgit.in/1APriiO>



More drone than rocket

Airbus just offered a peek at "Adeline", its reusable rocket! Read more <http://dgit.in/1GwiwrL>

options to choose from. The ones we have seen for ourselves are the ASUS X555LJ-XX177H, Lenovo G50 and Acer Aspire E15 E5-571G, all of which come with barely more than a basic discrete mobile GPU chip. The ASUS X555LJ-XX177H has shown to be a bit better than the others in our tests. If you can't expand your budget, it's a shame, because you will be a disappointed laptop gamer, my friend. For



Mi Powerbank 10400

a little more insight, do remember to check out this month's comparison test that starts from page number 66.

One powerbank for all

I've been reading your tips in the magazine so I thought I might as well write in to ask about a good Powerbank for my devices. I am seriously confused. I will put forth my questions, but before that a noteworthy mention:- I have the following devices Xperia E, Xperia C and an Zenfone 2(no boostmaster, normal charging).

My questions:

1. Which is the best Powerbank according to you for the devices listed Above. I am hunting for a 10000 mAh powerbank. I've decided to go for Sony powerbanks, but the reviews on online stores disappoint me. Plus the cost is ridiculously high compared to the others. Zenpower too is a good option I guess, but will it charge the sony devices properly?
2. From what I've researched so far, Powerbanks are still evolving. No powerbank is perfect.

Please guide me through this. I seriously want a good powerbank quickly as I will be traveling in the coming month.

Another mention is the Adata P100. It's for ₹999 on Amazon. But they don't offer

warranty in India. Is it still safe to use? Please clear my doubts.

– Jatin Wani

A Almost every power bank available does provide an output of 1-1.5 Amp which is more than sufficient for all your devices. As for your concerns over safety, you need to check if the power bank has protection circuits like Over Charging Protection, Short Circuit Protection, Over Current Protection etc. These are more of a secondary layer of protection since phones these days do come with similar circuits inbuilt so both the powerbank and the phone take care of the charging process.

The choice of brand is up to you. Ideally, you'd go with brand that you trust and has a service centre in your vicinity. You don't have to buy the same brand as your phone. The only outlier is Apple since their devices only charge properly on Apple certified chargers. Any other charger will be considered incompatible and the charging will take place at a very slow pace.

Power banks, like any technology in existence, are always evolving and the question of perfection is moot.

Simply, pick a power bank from a known brand with all the protection circuits mentioned earlier. The longevity of the device depends completely on the way you use it. Follow proper charge and discharge cycles and be careful of handling them since they're all Lithium-Ion batteries these days. From our tests, we'd recommend CyberPower, CoolerMaster and Mi. Even ADATA is a trustworthy brand if you wish to go with them.

New GPU for a SFF PC

Hey Digit, It's a pleasure to have gotten in touch with you. Anyways my PC Configuration is:

- Intel Core i3 3220 3.3 GHz
- NVIDIA GT 620 2 GB
- RAM: 4 GB

It's basically a DELL INSPIRON 660s manufactured in 2012-2013. I've a very serious matter at hand... I'm looking to upgrade my PC as I'm not able to play some games like GTA V, Watch Dogs AND Assassin's Creed Unity. I was thinking of

buying a GPU like ZOTAC GTX 750 Ti 2 GB or a Zotac GT 730 2 GB because my budget is ₹10K but I came to know about a huge problem as I went about researching for a suitable card. My older GPU, the NVIDIA GT 620 2 GB is quite small in size (15 cm x 9 cm x 1.8 cm) and the same goes for my cabinet. Sadly, I cannot buy a new cabinet so I thought you'd be able to help me with this problem. I hope you can suggest a good GPU under ₹10K - 12K but small in size like NVIDIA GT 620 2 GB as I'm dying to play these games. :(I even looked up Sapphire GPUs like R7 250, 260, 260x but they didn't even match that small size. It's okay if I can play these games on playable or medium settings but please suggest a GPU that meets the size constraints. Thank you.

– Sagar Sharma



GALAX GTX 750 Ti OC Low Profile

A We understand your concerns about having to upgrade a Slim Form Factor computer. And graphics card manufacturers do too. The keywords you're looking for is "Half-Height" or "Low-Profile". There are plenty of half-height graphics cards on the market but they tend to be low-end cards and very rarely mid-range cards because the higher up you go along the GPU family, the heat generated becomes a tad too much for half-height coolers to manage. So you'll never see anything upwards of an R9 from AMD or GTX 760. You have to settle for an R7 250 or a GTX 750 Ti. Given your budget, you can go for the GTX 750 Ti which offers much better performance at the ₹12K mark. You can easily find low-profile SKUs from ZOTAC and Galaxy on most ecommerce stores. Here's one that we found that's low-profile and within your budget - <http://dgit.in/HH750Ti>

digit RECOMMENDED BUYS

From smartphones to graphics cards, here's what we recommend for your next purchase!



TOP 3 BUDGET SMARTPHONES

Brand	Model	Price (in ₹)
Asus	Zenfone 2	14,999
Xiaomi	Mi 4i	12,999
Micromax	Yu Yuphoria	8,999



TOP 3 SMARTPHONES

Brand	Model	Price (in ₹)
Samsung	Galaxy S6 Edge	48,474
Motorola	Moto Turbo	41,999
Apple	iPhone 6	42,599



TOP 3 GAMING LAPTOPS

Brand	Model	Price (in ₹)
Alienware	17 R2 (2015)	1,79,900
ASUS	ROG G750 JX	1,49,990
MSI	MSI GE60 2PE	1,39,400



TOP 3 ULTRABOOKS

Brand	Model	Price (in ₹)
Acer	Aspire S7-392	1,15,565
Dell	Inspiron 14 7437	58,990
Apple	MacBook Air (13.3 inch 256GB)	79,494



TOP 3 WIRELESS ROUTERS

Brand	Model	Price (in ₹)
NETGEAR	Nighthawk R8000 AC3200	18,900
ASUS	AC2400	21,950
Linksys	AC1900	16,100



TOP 3 GRAPHICS CARDS

Brand	Model	Price (in ₹)
XFX	Radeon R9 295X2	90,999
NVIDIA	GTX Titan X	85,099
ZOTAC	GTX 980 AMP! Extreme Edition	50,744



TOP 3 BUDGET TABLETS

Brand	Model	Price (in ₹)
Lenovo	A8-50 (16 GB Cellular)	16,850
Apple	iPad Mini (Wi-Fi)	16,700
Xiaomi	Mi Pad	12,999



TOP 3 TABLETS

Brand	Model	Price (in ₹)
Lenovo	Yoga 2 (32 GB Cellular)	48,290
Samsung	Galaxy Note 10.1 (32 GB Cellular)	47,369
Apple	iPad Air 2 (32 GB Cellular)	42,900



TOP 3 SMART BANDS

Brand	Model	Price (in ₹)
Huawei	Talkband B2	11,000
Goquii	Band	3,999
Xiaomi	Mi Band	999



TOP 3 DSLR CAMERAS

Brand	Model	Price (in ₹)
Nikon	D4	356,024
Canon	EOS 5D Mark III	176,490
Nikon	D800E	160,850



The wrong kind of Message

A Harvard student found out that your exact location can be pinpointed due to an exploit in Facebook Messenger: <http://dgit.in/1Fx07X4>



Want to be a guinea pig?

Find out what it's like to be a test subject for brain a.k.a. neuroscience experiments. <http://dgit.in/brainexp>

SPEND SMART

This month we bring to you the best Gaming monitors, CPU coolers, Graphics cards and Cabinets in the market



GAMING MONITORS

Brand	Model	Panel type	Connectivity options	Response time (in ms)	Screen Size (in inches)	Price (in ₹)
ASUS	PQ321QE	IGZO	Display Port 1.2	NA	31.5	2,17,392
ASUS	Rog Swift PG278Q WQHD 3D	NA	Display Port 1.2/ DVI/ HDMI	1	27	64,603
ASUS	PB278Q	PLS	Display Port/VGA/DVI/HDMI	NA	27	41,491
ASUS	VG278H 3D	NA	VGA/DVI/HDMI	2	27	36,300
BenQ	XL2420Z	TN	VGA/DVI/HDMI	1	24	32,349
Dell	U2410	IPS	VGA/DVI/HDMI	NA	24	31,499
BenQ	XL2411T	TN	VGA/Display port/DVI/HDMI	5	24	25,145
BenQ	XL2411Z	TN	VGA/Display port/DVI/HDMI	1	24	24,999
ASUS	VG248	TN	Display port/DVI/HDMI	1	24	22,000
AOC	G2460Pqu	16 MP	VGA/Display port/DVI/HDMI	5	24	18,390
LG	25UM65-P	IPS	Display port/DVI/HDMI	5	24	16,990
BenQ	RL2455HM	TN	VGA/DVI/HDMI	1	24	14,499
BenQ	RL2450H	TN	VGA/DVI/HDMI	2	24	13,990
BenQ	RL2240HE	TN	VGA/DVI/HDMI	1	21.5	9,890



GRAPHICS CARDS

Brand	Model	Memory Size	Display Outputs (DVI/ HDMI)	Memory Type	Price (in ₹)
XFX	XF7 R7-240A-CLF2	2048MB	2	DDR3	5,759.00
ZOTAC	ZT-61001-10M	1GB	3	GDDR5	8,650.00
XFX	FX-779A-ZNJ4	1GB	3	DDR5	10,280.00
ZOTAC	ZT-50205-10P	1280 MB	3	GDDR5	18,725.00
SAPPHIRE	TOXIC R9 280X 3GB GDDR5	3GB	5	GDDR5	26,999.00
ASUS	R9 290 R9290-4GD5	4GB	4	GDDR5	33,499.00
ZOTAC	ZT-90201-10P	4GB	5	GDDR5	44,999.00
Leadtek	Quadro 4000	2GB	3	GDDR5	53,500.00
ASUS	GTXTITANBLACK-6GD5	6Gb	4	GDDR5	75,528.00
ZOTAC	ZT-90401-10P	12GB	5	GDDR5	83,430.00
ZOTAC	ZT-70901-10P	12GB	4	GDDR6	235,599.00



Multitasking made easy

iOS 9 will come with a split screen multitasking mode.

<http://dgit.in/appleios9>



Hip Hop Orchestra

Orchestrated and conducted by JIMEK, here is a medley of 30 of your favorite hip hop songs. <http://dgit.in/coolorch>

Price Watch



CPU COOLERS

Brand	Model	Radiator size	Cooler Type	Price (in ₹)
Swiftech	H320	360	Liquid	13,649
Swiftech	H220	240	Liquid	11,799
NZXT	Kraken X61	280	Liquid	9,529
Antec	KUHLER H20 950	140	Liquid	8,640
Cooler Master	Seidon 240M RL-S24M-24PK-R1	280	Liquid	8,084
Noctua	NH-D15	120	Air	7,299
Corsair	Hydro Series H80	120	Liquid	6,853
Noctua	NH-C14	140	Air	6,257
NZXT	Kraken X31	120	Liquid	5,899
Corsair	Hydro Series H70	120	Liquid	5,404
Noctua	NH-L12	120	Air	4,419
Corsair	Hydro Series H60	120	Liquid	4,248
Cooler Master	TPC 612 RR-T612-20PK-R1	120	Air	4,066
Corsair	Hydro Series H40	120	Liquid	3,708
Cooler Master	Hyper 412 Slim RR-H412-16PK-R1	120	Air	3,651
Noctua	NH-L9a SSO2	92	Air	3,129
Cooler Master	Hyper 212X RR-212X-20PM-R1	120	Air	2,899
Cooler Master	Hyper 212 Evo CPU RR-212E-20PK-R2	120	Air	2,515
Antec	C40	120	Air	2,078
Cooler Master	Hyper TX3 EVO RR-TX3E-28PK-R1	120	Air	1,532
Thermalright	Ultra 120 Extreme Rev. C	120	Air	1,100
Antec	A20	80	Air	799



CABINETS

Brand	Model	Size	Dimensions	Drive Bays	Price (in ₹)
Silverstone	SST- PS03B-W	Mid Tower	200 mm(w)x 472mm(h) x 471mm(d)	12	2,499.00
Cooler Master	MIN-110-KKA200	Slim Mini-iTX	268 x 70 x 290mm	3	4,605.00
NZXT	CA-PH240-W1	Mid Tower	195 x 530 x 529 mm	15	5,247.00
Corsair	CC-9011012-WW	Mid-Tower	20.5" x 8.1" x 20"	10	7,711.00
Antec	Skeleton	ATX Mini Tower	33 cm(H) x 37.6 cm(W) x 41.9 cm(D)	4	10,200.00
Cooler Master	SGC-5000-KKN1	ATX Mid Tower	250 x 605.6 x 578.5 mm	30	14,137.00
NZXT	NZXT Phantom 820	Full Tower	235mm (W) x 650mm (H) x 612mm (D)	10	17,489.00
Corsair	800D	Full-Tower	609mm X 609mm X 229 mm	11	20,563.00
Corsair	Corsair Obsidian Series 900D	Super Tower	27.2" x 9.9" x 25.6"	20	24,292.00
CoolerMaster	RC-1200-KKN1	Ultra Tower	344 x 704 x 664 mm	16	26,000.00

■ Basic rig = ₹23,669 ■ HTPC = ₹28,514 ■ Entry-level gaming = ₹54,827 ■ Mid-range gaming = ₹65,448 ■ Ultra high-end = ₹2,61,179 ■ Digit Test Rig = ₹3,85,793

BASIC RIG

Processor	Intel Pentium G3240	3,490
Motherboard	ASUS H81M-CS	3,400
RAM	Kingston ValueRAM 2 GB 1600MHz	1,019
HDD	Hitachi 500GB DT01ACA050	2,695
Graphics Card	None	0
PSU	Corsair VS450	2,190
Speakers (2.1)	Creative SBS A120	1,219
Optical Drive	Samsung SH-224DB/IDDS	1,049
Mouse	Logitech MK200 (Bundle)	762
Keyboard	Logitech MK200 (Bundle)	0
Sound Card	None	0
Sub-total	(Excluding Monitor and Cabinet)	15,824
Monitor	Dell E2014H 19.5 inch LED	5,495
Cabinet	Antec ASK-4000B-U3	2,350
Total		₹23,669

HTPC

Processor	Intel Core i3-4150	6,990
Motherboard	MSI B85M-G43	6,180
RAM	G.Skill RipjawsX DDR3 4 GB (2 x 2 GB) PC RAM (F3-12800CL9D-4GBXL)	2,983
HDD	Western Digital WD30EZRX 3TB	7,999
Graphics Card	None (IGP HD4400)	0
PSU	Corsair VS450	2,190
Speakers	None	0
Optical Drive	Samsung SH-224DB/IDDS	1,049
Mouse	Logitech MK220 Wireless Combo	1,123
Keyboard	Bundled	0
Sound Card	None	0
Monitor	None (your TV)	0
Cabinet	Silverstone Sugo Series SST-SG02B-F-USB3.0	3,750
Total		₹28,514

ENTRY-LEVEL GAMING

Processor	AMD FX8320	9,690
Motherboard	Gigabyte GA-970A-DS3P	5,290
RAM	ADATA Premier DDR3 4 GB (2 x 2 GB) PC RAM (AD3U1333B2G9-R)	2,799
HDD	Seagate Barracuda 1TB	3,333
Graphics Card	SAPPHIRE R7 265 2GB	10,990
PSU	Cooler Master Thunder 450W	2,790
Speakers	Creative GigaWorks T20 Series II	6,999
Optical Drive	Samsung SH-224DB/IDDS	1,049
Mouse	Logitech MK200 (Bundle)	762
Keyboard	Logitech MK200 (Bundle)	0
Sound Card	None	0
Sub-total	(Excluding Monitor and Cabinet)	43,702
Monitor	Dell S2240L	8,276
Cabinet	Antec X1-T Gaming	2,849
Total		₹54,827

MID-RANGE GAMING

Processor	Intel Core i5-4460	11,490
Motherboard	ASUS B85M-G	5,290
RAM	Gskill SNIPER F3-12800CL9D-8GBSR1	5,233
HDD	Toshiba 1TB DT01ACA100	3,450
Graphics Card	HIS R9 270X 2GB	12,190
PSU	Seasonic S12II 620 Watts	5,623
Speakers	Creative GigaWorks T20 Series II	6,999
Optical Drive	Samsung SH-224DB/IDDS	1,049
Mouse	E Blue Cobra Advanced Combo (Bundle)	2,999
Keyboard	E Blue Cobra Advanced Combo (Bundle)	0
Sound Card	None	0
Sub-total	(Excluding Monitor and Cabinet)	54,323
Monitor	Dell S2240L	8,276
Cabinet	Antec X1-T Gaming	2,849
Total		₹65,448

ULTRA HIGH-END GAMING

Processor	Intel Core i7-4790K	22,490
Motherboard	ASRock Z97 Extreme6	13,762
RAM	Kingston HyperX Predator 2x 8GB KH21C11T2K2/8X	16,298
HDD	WD WD30EZRX 3TB + Samsung 850 Pro 256GB SSD	19,598
Monitor	ASUS PB279Q 4K UHD	62,500
Graphics Card	ZOTAC NVIDIA GTX 980	46,491
Cabinet	Corsair Obsidian Series 750D	12,049
PSU	Antec HCP-1000 Platinum 1000W	18,480
Speakers	Logitech Z906 5.1	18,790
Optical Drive	LG Blu-ray WH16NS40 RW	5,885
Mouse	Razer Death Adder 2013	3,399
Keyboard	Corsair Vengeance K70 RGB	12,637
Sound Card	ASUS Xonar D2X 7.1	8,800
Total		₹2,61,179

PRIMARY DIGIT TEST RIG

Processor	Intel Core i7 - 4960X (Extreme Edition)	70,159
Motherboard	ASRock X79 Extreme 9	27,846
RAM	Corsair Dominator 2133MHz (8GB x 4) (CMD32GX3M4A2133C9)	48,500
HDD	Toshiba DT01ABA100V	3,704
SSD	SanDisk Extreme II 240GB (x2 for HDD testing)	24,078
PCIe SSD	Kingston HyperX 480GB	28,999
Graphics Card	NVIDIA GeForce GTX TITAN X	85,099
Cooler	Intel RTS2011LC - Stock AIO	NA
PSU	Corsair HX1050	16,059
Monitor	ASUS PB279Q	62,500
Optical Drive	NA	NA
Mouse	Razer Ouroboros Elite	10,750
Keyboard	Tt eSPORTS Poseidon Z	8,099
Total		₹3,85,793

Critical tech for critical business needs

Intel's new E7 servers are high on tech, geared for business, meant for mission critical services that businesses can't do without

Jayesh Shinde

jayesh.shinde@digit.in

In the age of the Internet, where all of us are hooked onto content consumption portals, indulging in ecommerce, and uploading humongous amounts of data in the cloud, powering the backend of all the services we love is a herculean exercise. Data center farms with servers processing millions of instructions per second, crunching petabytes and zetabytes of data. And where traditional CPUs have dual-core, quad-core configurations, imagine a processor with 18 dual-threaded cores. Quite a powerhouse, which is what the new Intel Xeon E7 v3 chips are essentially. With these new server chips, Intel has taken x86 computing to new heights, beating traditional POWER8 and RISC-based servers in over 20 new performance benchmarks.

What's new?

Aimed at higher end of the market meant for mission critical computing needs, the sparkling new Xeon E7 v3 Haswell processor comes with a number of improvements over its Ivy Bridge predecessor (the E7 v2), which include increased number of cores, increased cache size and support for the latest DDR4 memory which has faster speeds and lower power consumption than the older DDR3.

Intel has made a number of small but significant improvements to the processor which include separate clock and voltage domains for each core which make the

already power efficient processor even more optimized by allocating power only where it is actually needed. Also added is the new multiple rank sparing and DDR4 addr/cmd parity error recovery which has led to an improved uptime, increased system robustness and reduces the overall service costs. Not only is the number of cores increased but also the performance per core has been significantly improved. This has been possible because of the

5-10 times better performance per dollar compared to traditional IBM Power-based systems. Go here, for more info: <http://www.intel.com/content/www/us/en/processors/xeon/xeon-e7-details.html>

Who needs these chips?

Any business that's dependent on big data analytics on a real-time basis, sensitive to scaling needs, develop unique insights in your business, drive customers, and create new business models to transform organizational processes should look for servers running on Intel's new Xeon E7 v3 processors. According to Intel, seventeen server manufacturers are slated to start shipping

Features	Intel® Xeon® processor E7-8800/4800/2800 v2 product family (IVB-EX)	Intel® Xeon® processor E7-8800/4800 v3 product family (HSW-EX)
Socket	R1	
Process technology	22 nm	
Cores	Up to 15	Up to 18
TDP	155W Max	165W Max
AVX Support	AVX 1 - 8 DP Flops/Clock/Core	AVX 2 - 16 DP Flops/Clock/Core
Intel® QPI Ports/speed	3x Intel QPI v1.1, 8.0 GT/s max.	3x Intel QPI v1.1, 9.6 GT/s max.
Core Addressability	46 bit /48 bit virtual	
Last Level Cache Size	Up to 37.5MB	Up to 45MB
Memory DDR4 speeds	N/A	Perf Mode: 1333 MT/s, 1600 MT/s Lockstep Mode: 1333, 1600, 1866 MT/s
Memory DDR3 speeds	Perf Mode: 1066, 1333 MT/s Lockstep Mode: 1066, 1333, 1600 MT/s	Perf Mode: 1066, 1333 MT/s, 1600 MT/s Lockstep Mode: 1066, 1333, 1600 MT/s
VMSE Speeds	Up to 2667 MT/s	Up to 3200 MT/s
DIMMs/Socket	24 DIMMs/(3DIMMs/DDR3 channel)	24 DIMMs/(3 DIMMs/DDR4 or DDR3 channel)
RAS	WSM EX Baseline Features + • eMCA Gen 1 • MCA recovery - Execution Path • MCA IO • PCIe LER	IVB-EX Baseline + • eMCA Gen2 • Address Based Memory Mirroring • Multiple Rank Sparing • DDR4 recovery for command/address parity errors
Intel® Integrated I/O	32 PCIe* 3.0, 1x x4 DMI2	
Security	Intel® TXT, Intel® AES-NI, Intel® Platform Protection with OS Guard, Intel® Data Protection with Secure Key	
Common Platform Technologies	Intel® Run Sure Technology, Intel® Turbo Boost Technology, Intel® Hyper-Threading Technology, Intel® Dynamic Power, Intel® VT-x, Intel® VT-d, Intel® VT-c, Intel® I/OAT/CB3, Intel® Node Manager, Intel® AVX	

addition of two fully buffered rings, which have increased the bandwidth per core, and TSX, that not only allows transactional execution without locking but also Fine grain behavior at coarse grain effort. The v3 also comes with integrated IO hub that has increased both the PCIe bandwidth and latency tolerance, and also has better virtualization capabilities thanks to the adaptive LLC allocation policy and the Cache allocation monitoring. What does all of this translate to? Performance boost of 40 per cent compared to Xeon E7 v2, and

Xeon E7 v3 systems later this year, and especially with a large server refresh cycle taking place in 2015, that should present lots of businesses an opportunity to make use of Intel's offerings. For IT managers and hardware technology vendors who are cost-conscious, sure these new Intel Xeon E7 v3 chips aren't available for cheap. But if time is money, and depending on your unique business needs, it may be a worthwhile investment to consider. If there's one thing about silicon in the realm of computing - newer is almost always better. **d**

Google maps easter eggs

Now choose among your favorite public transportation on google maps. Ride a train, tube, bus, boat, dragon or the lochness monster <http://dgit.in/gmapdragon>



Drive for Uber

Uber's new mobile game UberDRIVE lets you be the driver. Is Uber trying to lose its bad image? Read more <http://dgit.in/Uberdrv>



Growth, 14nm chips and taking down Qualcomm: MediaTek talks to Digit

MediaTek, the chief competitor to Qualcomm in the market, has found a very rare chance to dig into the American chipset maker's market lead.

◀ Finbarr Moynihan, General Manager, Corporate Sales International

Prasid Banerjee

prasid.banerjee@digit.in

Q Everybody is talking about R&D in India. What's really different about India, from the market side?

FM: I think in some sense it's not that different, while in some senses it's different. If you look at it, India tends to lag behind China. What's interesting is, in India, the percentage of mobile Internet access is higher than anywhere else. It gives India the potential to be very much a mobile first Internet community, which I think creates some interesting use cases.

Q Is there a difference because of the maturity of the market? Like China is largely considered to be a more mature market than India.

FM: Perhaps. You know, it moves. If you think about the mobile industry, it to some sense started in Europe, with Nokia, Ericsson, Siemens etc. Now, Nokia is part of Microsoft, Ericsson is part of Sony and Europe is more about the infrastructure. The mobile platforms have moved to the west coast with Apple, Google, Microsoft. That's not the whole story, but that's the way it's going. Where next right?

Q Is India the obvious answer to that?

FM: It seems to be right? It's a big market,

it's a big population, I don't want to say it's a homogenous market, but it's at least one country right? If you think about Africa, Europe, Latin America, the problem is those are not one country. There are so many countries, all with unique import/export duties, government taxes etc. and it's much more fragmented. The only other market that has that kind of scale as a single market is India, I think.

Q Getting to the chipsets that you make, MediaTek has till now been associated with the more affordable range of mobile phones, do you plan to get into a flagship range?

FM: Yes, absolutely. It's very much a key focus for us. While yes, historically on mobile we've been more associated with entry and mainstream products, the not so well known part of MediaTek is, we also have a very strong business in the home entertainment space. A lot of that capability is now coming into mobiles, like 2K displays, 4K video etc. So we've been able to bring a lot of that technology and integrate it into our mobile platforms. You see us starting with Helio X10, we just announced X20, which brings a whole new set of innovations with deca core, tri-cluster etc. And then the exciting thing is that we start to see brands like HTC, and you'll see more, launching flagship products based on Helio.

Q What other top brands except HTC are using Helio?

FM: Right now only Chinese brands have announced Helio devices.

Q But to truly go global, you have to enter the US market right? And for that you need a solid tier I brand, or you're looking at the Chinese manufacturers penetrating the US market?

FM: Both. One of our customers, Alcatel, just launched an LTE phone in the US market, so we're already shipping LTE to the US market. But the US market is a different market. It's a heavily operator subsidised market, but operators are starting to test the limits of device subsidies. They're starting to unbundle the price from the contract. It's early, and isn't a big part of the market, but I think it's inevitable over time. That I think it favours us, because then it becomes the device on its own, with the features and the value proposition.

Q Yes, they ship in those markets, but like you said, LG is going to launch MediaTek driven devices, but the inexpensive ones. So it's like when an OEM wants its devices to be cheaper, they go with MediaTek.

FM: No I wouldn't say that's the case, I would say it's about the right features at the right power and performance.



Eat a brain a day

How eating the brains of their dead relatives led to the people of a once-isolated tribe develop immunity to various brain diseases? <http://dgit.in/eatabrain>



Industry Connect

I think to categorise it as cheaper is a mischaracterization. I think a lot of those brands that you mentioned, tend to have one flagship product, which tends to be today, Qualcomm. That decision tends to be driven by the fact that it's pivoted on having one platform that supports all the features globally. Today, MediaTek's modem technology isn't as advanced as Qualcomm's, the X20's modem is up to that level, but it's going to sample later this year, so we'll see what happens in 2016 with devices based on that.

d Moving on, like you said, calling it 'cheap' is a mischaracterization, don't you think that's because MediaTek doesn't market itself enough?

FM: Yes it's a factor for sure. MediaTek started to rebrand only a year and a half ago, at Barcelona last year. And you'll see us doing more. But to me, Snapdragon is almost synonymous with Qualcomm. For us though, Helio is going to define an experience, we'll have Helio and non-Helio products.

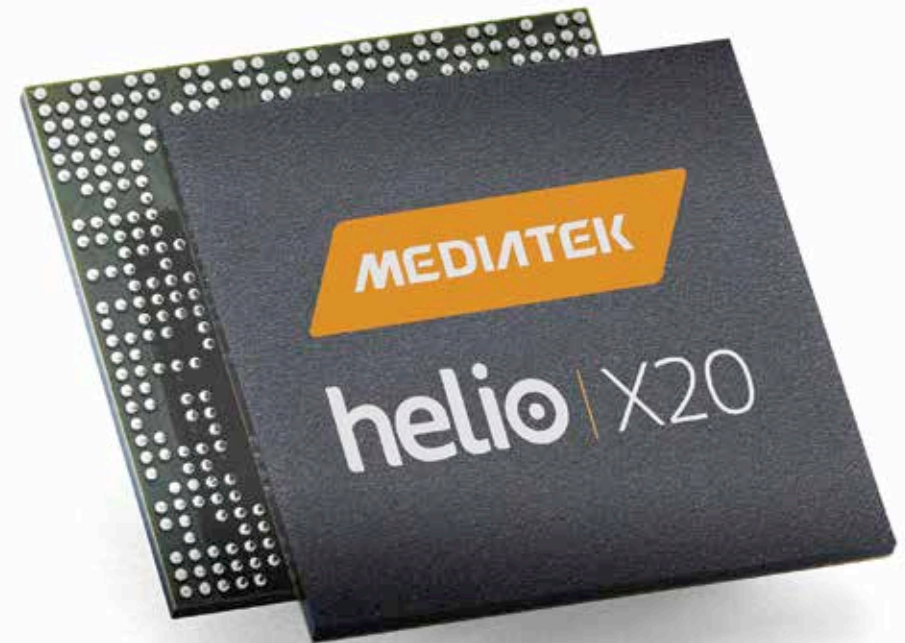
d And this would be the right time to do that right? You have your Helio X10, P10 and X20 right now. How else would you characterise them?

FM: Like I said, we'll concentrate on making Helio a sub-brand of MediaTek. I personally think that with the X10, P10 and X20 in that high and premium range, we now have the products that give a pretty good run for their money to Qualcomm.

d But it seems like you're still waiting for the products to prove that?

FM: Well, the P10 and X20 haven't shipped yet, so yes that's true. Those battles are being fought now, and the devices won't show up till next year. I think we've changed a lot, in the past we wouldn't have told anyone about the P10 and X20 before they actually came to the market on products, but now we're talking about it six months in advance.

That's also a reflection of our changed position. Because if you're only focused on mainstream and entry devices, they move pretty quickly. But focusing on flagships, the development cycles take more



time, and there's a longer cycle. So they tend to promote earlier as well.

d Both Intel and Samsung have worked on the 14nm processes already. Are you also working on the same?

FM: Yes, of course we do. Next year sometime. We announced X20 recently, so you can expect what comes next to be on the 14nm process.

d We've got feedback from a lot of people that MediaTek SoCs don't get custom ROMs. Why is that? Is it because of something on MediaTek's end?

FM: I don't think so. We're very open to working with that community if they want to, and we're open to supporting that. I think it's something on the ROM developers' end.

d Coming back to the SoCs, heating is a big issue in India. But if you look at processors, they are still developed based in colder regions, which means automatically there's less headroom for India. So if you're setting up R&D Centers in India, then why is this not being researched? Is it because it isn't possible at the moment?

FM: That's a good observation. Of course it's possible, it's ultimately physics. If your base is 45 degrees instead of 25 degrees, then you've already started

higher. I think all you can do then is work on all of the aspects that can reduce the power consumption. For example, we would argue that with our CorePilot algorithm in the Helio X20, if properly used, you use the right core for the right job. So it can reduce the power consumption by about 30%.

d In terms of the brands that are associated with the MediaTek, how big a role do Chinese brands play in your future?

FM: Six of the top 10 smartphone brands today are Chinese brands, so inevitably they are an important factor in the market going forward. But you know, now Micromax starts to bubble into that top 10-12 level, so it's like watch this space, right? I think for anybody in this business, the Chinese brands are going to be a big factor in this market globally, that's just how it is.

d Do you see a Samsung losing its grasp on the market in say 5 years?

FM: I can't predict what's going to happen in the market in a year, let alone five years. I expect more growth from the China brands, at the expense of who, I can't predict. **d**

To check out the complete interview either Blipp this page or visit - <http://dgit.in/mtek-moynihan>



This is electrifying

Venezuela experiences a natural phenomenon of lightning-only storms that occurs 160 nights in a year. <http://digit.in/lightning>



Trends in telecom, acquisitions and more

Nigel Eastwood, CEO, New Call Telecom shares his thoughts on trends in the Indian telecom industry. Supplementing New Call's growth strategy, we're also privy to insights from Vikas Saxena, CEO, Nimbuzz and Sanjeev Bobby Sarin, Founder, Ozone



▲ From l-r: Nigel Eastwood, Vikas Saxena and Sanjeev Bobby Sarin

d There seems to be a resurgence of VoIP in the industry now that WhatsApp has jumped on to the bandwagon as well. What are your thoughts on that?

Nigel: If you think about it, VoIP's been around for a decade. In fact, some of the first VoIP technology was launched in 2006 – it's not a new phenomenon. Actually, in the west, VoIP has been utilised quite a lot for business over the last 3-5 years. Suddenly, these big tech giants think they've found the new great thing when it's been around for ages.

If you actually review the way that people communicate via Facebook, WhatsApp or other messaging platforms, it's been about replacing SMS over the last 3-5 years. But suddenly now people realise voice isn't going away. If you look at emerging markets now, you'll realise that people still want to talk. Also, look at the average small business operator, voice is still the way they do business and will continue to for many years to come. Even the average SMB (Small and Medium Business) here in India – there are maybe 50 million of them – has a mobile number associated with its retail outlet. There's no hashtag or mention of Twitter or Facebook. It's all on voice. It's the same in Africa, and generally across emerging markets in Asia – that trend isn't going away.

d What will be the top trends in telecom that will affect users in the near future, either positive or negative?

Nigel: As we've seen in India, e-commerce or as I call it "the flipkart-isation of India" almost over the last two years has led to people finally awakening to the idea of acquiring goods over the internet. That has led to a whole new range of business models – from furniture to lingerie.

Areas that I see trending are also committed to disrupting the traditional business models, i.e. banking and fintech with the emergence of things revolving around peer-to-peer lending and mobile wallets.

Fintech has just started to take a good foothold across the world – so that's one to watch.

Content, in all its forms, is now being driven more and more online. In the west, we see lots of platforms really starting to challenge the big goliaths – the big cable operators. The Netflix model (the video-on-demand model) is certainly the new trend.

Traditionally, the millennial generation isn't at all interested in set-top-boxes or viewing content via satellite. These models will proliferate again. The process of con-

suming video data is now called "snacking". So you take a little bit of data at home, you jump on the metro, you view your favourite soap opera on the train for 15 minutes while you get to work, you get to office and at lunch continue watching. It's all synced. The viewing media has gone down from 32 inches to less than 10 inches. This model will be very dominant moving forward.

No matter what we're doing in the digital world, we leave our digital thumbprint. Things related to Big Data, data security, national identification, all of these e-govt initiatives will start to create more jobs, more opportunities as we move forward. Collaboration, the Dropbox-type interface, is becoming more and more apparent as businesses seem to want to drive more virtual operations, to have virtual teams working across India in collaboration without the cumbersome overheads of occupancy of offices. The home-working phenomenon is certainly there and the types of collaborative software that are being released really help. We've seen big valuations over the last few months.

If we look at India and the Modi government focusing on areas to really improve



What is Snapchat?

After 4 years of its launch, Snapchat CEO released an extra low quality video explaining how it works <http://dgit.in/snapchatvid>



From running to twitter

Sonic the Hedgehog now has an official Twitter handle where he posts funny replies to fans. See more: <http://dgit.in/snctwttr>

Industry Connect

the lives of 800 million people from the less well off bracket, e-healthcare and e-education are two big, mighty subjects. Lots of entrepreneurs are innovating around these, and certainly there are several billion-dollar businesses that are sure to be created in the coming years. Finally, and particularly important for India is Utility Management and Machine-to-Machine communication.

Demand side energy management is particularly important for markets that find it difficult to produce their own energy and have infrastructure problems to deliver energy.

To answer your question fully, the negative trend that kind of troubles me is around net neutrality. This whole issue has come to the forefront in the last month or so in India. I've been very vocal about this from New Call's perspective around how we view that in the global context. I look at the traditional telecom model, and it's got to change.

Let's look at what happened in the early 1800s in England where people were moving from transportation which was canal-barges to move coal around the country, to trains. Can we stop progress? No. Was there an uproar? People embraced change. It's an unusual analogy, but, similarly, telecom companies in India and across the globe need to embrace change. They have to embrace over-the-top services. They either have to acquire over-the-top services to complement their future roadmap, develop over-the-top services or partner with OTT service providers, rather than try to tinker around with a fundamental norm in the global marketplace of net neutrality. So, I think that is one negative side effect of the emergence of the app era and digitalisation.

I'm not sure I understand your analogy because, what you spoke of is an entire paradigm shift in a technology. There was no way but to migrate to that other form. Here we're talking about telcos giving preferential treatment to some entities, or some applications – creating pathways that are better for certain kind of people. That is something that...

Nigel: Well, we've got 50 million small to medium-sized businesses in India. If

we tinker with the issue of net neutrality, when will they ever get online? When will they have a voice? No. The Government needs to look into that segment of entrepreneurs in India that contributes over 50% of GDP today in India. We've got to look after them. Net neutrality and tinkering with net neutrality will be fatal for that segment that really underpins 50 million traditional SMBs. There's hundreds of millions of entrepreneurs in India who will want to come online, at one point or another. It's got to be fair and equitable to all. We can't give preference to others that can afford to pay, in my opinion.

Vikas: I think the apps which would start saving money or give you better data speed would be something that might come up. And right now, there would be businesses that would tinker with the overall data business that is being carried out in the country or anywhere in the world.

Bobby Sarin: Just to add to what Vikas has said, there's also a new solution that we're launching in India with a partner company around entertainment. It's about micro-caching content at locations. So imagine this scenario: you can go to a McDonalds, download a two-and-a-half hour movie without any broadband costs. This would normally take you about 60-90 minutes at home and you'd still have to pay for your broadband. But here it would take you merely 5-10 minutes. So, these disruptive type of solutions coming into the market will be key to changing the trend.

What's your take on regulated markets like India. Is the TRAI's framework supportive to new initiatives or is it an issue dealing with them?

Bobby Sarin: I think they're also learning along the way. There are more challenges in India than other markets in terms of protecting the consumer, protecting connections and knowing what the consumer is doing. For example, in the US, McDonalds can provide its own Wi-Fi without any validation checks. Starbucks does the same. In India, if you want to provide public Wi-Fi you need an ISP license, you need to register the user's mobile number and you also need to monitor the user's activity

and keep logs for five years. So, the security measures in India are a lot more stringent than they're in the West. If I were to ask myself "are the regulators doing what they should be doing?" I think they are. That makes life a little complex for us, but after terrorism incidents in Mumbai such as when a terrorist sent a message from an open public network, I think they're necessary. For two years after that incident, I had to fight an argument in the market that Wi-Fi is not associated with terrorism! I think the regulators are learning fast, they're putting more checkpoints in place, but it's healthy for the market.

Speaking of acquisitions, when will we see huge startups coming from India?

Vikas: You're now seeing the early days of that happening. Engineering and product mindset was lacking in this country for a long period of time. We were largely a services-oriented company wherein we did work for clients. This mindset is now rapidly getting developed, both – because of the successes that you see here (because success births success) and because a lot of people who lived in the Silicon Valley primarily are coming back to India and they're bringing their skillset with them. So these two or three big trends are coming together. First one is Venture Capitalism. Some people say it's just a bubble, but it's available. Earlier it wasn't. Second, the number of users who will take your service fast has gone up. I have been in a company before Nimbuzz also. One of the biggest constraints you had with the internet in 2006 was that when you launched a service it took a lot of time to scale. By that time the employees lose interest, investors lose interest and so on. That's completely changed now. I gave you the example of Hola with 10,000 downloads a day, but there was a time when we didn't have 10,000 downloads even in six months. And third, like I said, a product-oriented mindset is coming in. This is the primordial soup: Market, capital, talent – everything is there. **I**

For the full interview covering aspects such as the ubiquitous Wi-Fi, the Hola app and more, visit this shortlink: <http://dgit.in/ncallnbz> or Blipp this page.

Community

Our forum members help each other when it comes to buying advice. Take a look at some good samaritans!

**Morality in Machines**

How do you stop the robots from turning against us in the near future? By instilling/installing morals. <http://digit.in/moralrobot>

Weird Startup Ideas

All successful startups started off with ideas that seemed absurd at the time of their inception. Here are some more startup ideas which we came across that ended up being a little more than absurd, some of these are outright ridiculous.

**Layoffspace**

Launched in 2007, Layoffspace wanted to capitalise on the ongoing recession by starting off a social network for jobless people. As if this was exactly what jobless angry people wanted, a social network to while away one's time that too when Facebook was in its prime. Needless to say, it couldn't take on Facebook on its own.

Meet Pen

Imagine a device shaped like a really thick pen with a bulging head that you'd point at someone you wanted to meet. Did we mention that it was flesh coloured? Apart from its ridiculous design, the Meet Pen was to act as a socialising device that would let the person you'd pointed at know that you wanted to meet them, i.e. if they too owned a Meet Pen.

**Shweeb**

How cool would it be if you could reduce your carbon emission, get a work out, cook breakfast and get a good tan, AT THE SAME TIME!? Look no further, the Shweeb is a monorail concept which has a single rider enclosed in a clear transparent enclosure (read Solar Oven) pedalling away from point A to point B. Despite getting funded, it has yet to take off.

**WTF Prank Candles**

You set up a nice dinner date with home-made food and to set the mood you light some scented candles that've mysteriously arrived in the mail. Halfway into the date while you're canoodling with your date, your new lavender candles start spewing out the nastiest farts. Available scents include Dirty Fart, Sweaty Gym Socks, Stank Breath and more.

Throx

Throx hasn't come up with anything innovative. Instead of two, Throx offers three socks in one package – one for your left leg, one for your right and one for your... well if you ever lose one then you have a spare. We know one thing for sure, if not the general populace, this thing will end up being ridiculously popular among teenagers who've just hit puberty.

**Yo Bit*h**

Aaron Paul's infamous line from Breaking Bad got old pretty quickly but not before Aaron decided to eke out a few extra miles out of the new phenomenon. What arose was a rip-off of another absurd instant messaging app which only allowed users to insult each other with variations of Aaron's famous catchphrase. To this we say, No way Bit*h!



Higgs-Boson solved?

Three physicist, who have been working together for the past one year, might have found the answer to Higgs-Boson <http://digit.in/higsbos>

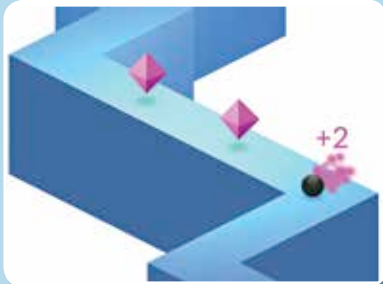


Sleeping soundly

Does an ideal sleep soundtrack exist? Nope, it differs from person to person. Find out more here <http://digit.in/soundslp>

Unwind

How we unwind



ZigZag

We're pretty certain that half the team members might end up with sprained thumbs thanks to this addictive game. While Siddharth started pondering about the psychological implications Jayesh tapped his way to score the highest amongst all but little did he reveal that he did so on a tablet. That lying cheat!

Black Mirror

Despite having been in the limelight for quite some time we've been neglecting this TV show. So when we finally got around to watching the first episode we were ~~pleasantly~~ unpleasantly surprised. Abhijit's young and impressionable mind has been soiled forever thanks to what happened in the climactic scene.



Witcher 3

Needless to say, Witcher 3 was the game of the month with Anirudh, Jayesh, Nikhil and Mithun hacking away at Griffins, Harpies and even the pesky li'l wolves with little care. Unfortunately, Jayesh couldn't experience all the graphical goodness since he's on a PS4.

digit DIARY

Oh, what a month it was. We've had a bevy of interns line up, their minds fresh and uncorrupted by the ways of the technologically insane. It wasn't going to last long, Abhijit and Mithun instantly took to the roles of cruel puppet-masters with reckless abandon.

Abhilash, Anshumala, Lavleen and Purusharth soon learnt to ignore the trolls and get on with the Intern Enrichment Programme. Jayesh and Purusharth bonded over many a nights spent at the office, leaving the other interns seething with jealousy. Any attempts to break their new found love was rebutted by Jayesh who'd then put Daft Punk's Instant Crush on an endlessly painful loop, much to Mithun's chagrin.

Abhilash left half-way into the month leaving Anshumala, Lavleen and Purusharth fighting for the crown. Hopefully, another month down the line we will have a winner!

Creepicheap's progeny have decided to take it up a notch, them nasty buggers have wisened up and are putting up quite the fight. They now mock us on a daily basis by snatching the bait without triggering the mouse traps and going so far as to run amok during the day with impunity.

Regidi and Abhijit decided that they'd had enough of work and rushed off back to school. But school didn't agree with Abhijit who was bitten by a cursed Aedes Aegypti and ended up hospitalised. Here's to hoping that the Bengali Babu makes a steady recovery.

Quote of the month:

The dumber you are, the more you get.

- Raabo



PC, Laptop
Tablet, Mobile

सुरक्षा



92.72.70.70.50
98.22.88.25.62

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The afterlife

What happens to your body after you die? A mortician herself describes how breakdown gives birth to new life. <http://dgit.in/dthprocess>



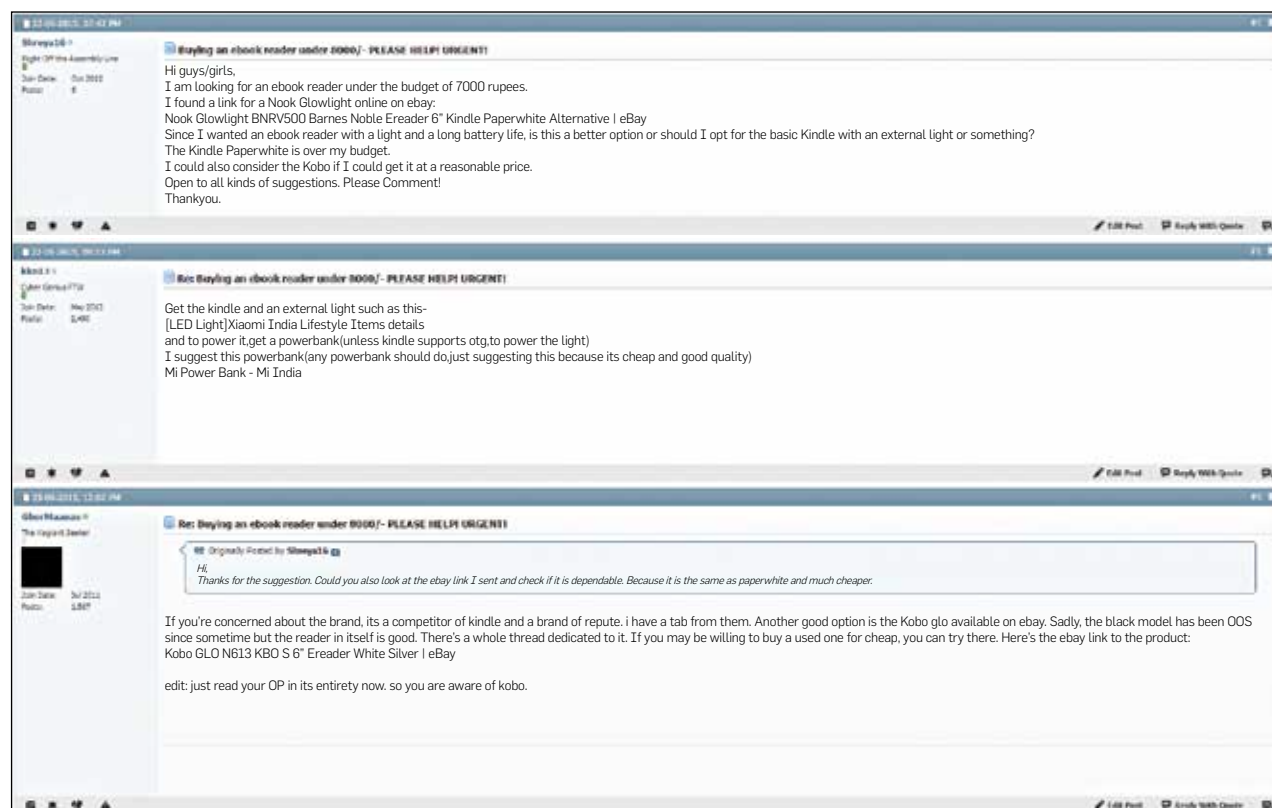
The easiest language?

"Esperanto" is an artificial language invented in 1887 and is finally gathering attention. Learn more about it here. <http://dgit.in/esplang>

Head over to **online communities** for some of the best discussions, buying advice and user reviews. Of course, you'll meet like-minded (and not-so-like-minded) geeks and of course, get help when you're stuck.



Deciding on getting an e-ink reader? Have a chat with some of our forum members, they might have a better insight than most reviews on e-commerce product pages.





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